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PENNSYLVANIA STATE



1988-89
Associate Degree
Programs Bulletin

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PENNSSTATE



University Park
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1988-89
Associate Degree
Programs Bulletin

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THE PENNSYLVANIA STATE UNIVERSITY BULLETIN (USPS 426-680)

VOLUME LXXXII September 1987 NUMBER 2

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UNIVERSITY CALENDAR*

SPRING SEMESTER 1988

JANUARY

- 5 Tuesday — Arrival date
- 7-8 Thursday, Friday — Registration
- 11 Monday — Classes begin

FEBRUARY

- 29, Mar. 1-4 Spring holiday, no classes

APRIL

- 29 Friday — Classes end
- 30, May 1 Saturday, Sunday — Study days

MAY

- 2-7 Monday to Saturday — Final examinations
- 14-15 Saturday; Sunday — Spring commencement

SUMMER SESSION 1988

Intersession

MAY

- 9 Monday — Classes begin

JUNE

- 3 Friday — Classes end

Eight-Week Session

JUNE

- 5 Sunday — Arrival date
- 6-7 Monday, Tuesday — Registration
- 8 Wednesday — Classes begin

JULY

- 4 Monday — Independence Day holiday, no classes#

AUGUST

- 3 Wednesday — Classes end
- 4-6 Thursday to Saturday — Final examinations
- 13 Saturday — Summer commencement

Six-Week Session

JUNE

- 22 Wednesday — Classes begin

AUGUST

- 3 Wednesday — Classes end

*This calendar is subject to change without notice. Although the University makes every effort to avoid conflicts with religious holidays in preparing the calendar for an academic year, such conflicts are sometimes unavoidable. When they occur, efforts are made to make special arrangements for the students affected.

#Classes that would have met on Monday, July 4, 1988, will meet on Wednesday, August 3, 1988.

FALL SEMESTER 1988

AUGUST

- 20 Saturday — Arrival date for new students
- 21 Sunday — Arrival date for returning students
- 22-23 Monday, Tuesday — Registration
- 24 Wednesday — Classes begin

SEPTEMBER

- 5 Monday — Labor Day holiday, no classes +

NOVEMBER

- 24-25 Thursday, Friday — Thanksgiving holiday, no classes

DECEMBER

- 9 Friday — Classes end
- 10-11 Saturday, Sunday — Study days

JANUARY

- 7 Saturday — Fall commencement

SPRING SEMESTER 1989

JANUARY

- 4 Wednesday — Arrival date
- 5-6 Thursday, Friday — Registration
- 9 Monday — Classes begin

FEBRUARY

- 27-28, Mar. 1-3 Spring holiday, no classes

APRIL

- 28 Friday — Classes end
- 29-30 Saturday, Sunday — Study days

MAY

- 1-6 Monday to Saturday — Final examinations
- 13-14 Saturday, Sunday — Spring commencement

SUMMER SESSION 1989

Intercession

MAY

- 8 Monday — Classes begin

JUNE

- 2 Friday — Classes end

Eight-Week Session

JUNE

- 4 Sunday — Arrival date
- 6 Tuesday — Registration
- 7 Wednesday — Classes begin

JULY

- 4 Tuesday — Independence Day holiday, no classes#

AUGUST

- 2 Wednesday — Classes end
- 3-5 Thursday to Saturday — Final examinations
- 12 Saturday — Summer commencement

Six-Week Session

JUNE

- 21 Wednesday — Classes begin

AUGUST

- 2 Wednesday — Classes end

+ Classes that would have met on Monday, September 5, 1988, will meet on Wednesday, December 7, 1988.
#Classes that would have met on Tuesday, July 4, 1989, will meet on Wednesday, August 3, 1989.

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| | • | • | • | • | • | • | • | • | | • | | • | • | • | • | • | • Architectural Engineering Technology |
| | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • Biomedical Equipment Technology (2) |
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| | • | • | • | • | • | • | • | • | | • | | • | • | • | • | • | • Dietetic Food Systems Management# |
| | | | | | | | | | | | • | | | | | | • Electrical Engineering Technology |
| | | | | | | | | | | | | | | | | | • Forest Technology |
| | | | | | | | | | | | | | | | | • | • Highway Engineering Technology (9) |
| | | | | • | • | | | | | | | | | | | | • Hotel, Restaurant, and Institutional Management |
| | | | | • | • | | | | | | | | | | | | • Labor Studies* |
| | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • Letters, Arts, and Sciences* |
| | • | • | • | • | | • | • | • | | • | | • | • | | • | • | • Mechanical Engineering Technology |
| | | | | | | • | | • | | | | • | | | | | • Medical Laboratory Technology (4) |
| | | | | | | | | | | | | | | | • | | • Metallurgical Engineering Technology |
| | • | • | • | • | • | • | • | • | | • | | • | • | • | • | • | • Microcomputer Engineering Technology (5) |
| | • | | | | | • | • | • | | | | • | | • | | • | • Mining Technology (9) |
| | • | • | • | • | • | • | • | • | | | • | • | • | • | | • | • Nuclear Engineering Technology (6) |
| | | | | | | | | • | | | | | | | | | • Physical Therapist Assistance (4) |
| | | | | | | | | | | | • | | | | | | • Railway Engineering Technology (9) |
| | • | • | | | | • | | | | • | | • | | | • | • | • Science—General Option |
| | | | | | | | | | | | | • | | • | | | • Science—Radiologic Technologist |
| | | | | | | • | | • | | | | | | | • | • | • Radiographer Option |
| | | | | | | | • | | | | | | | | | | • Sociology* |
| | | | | | | | | | | | | | | | • | • | • Solar and Thermal Technology (7) |
| | | | | | | | | | | | | | | | | • | • Surveying Technology |
| | • | • | • | • | • | • | • | • | | • | | • | • | • | • | • | • Telecommunications Technology (8) |
| | | | | | | • | | | | | | | | | | | • Wildlife Technology |

- (1) Second year offered only at University Park.
- (2) Second year offered only at New Kensington and Wilkes-Barre.
- (3) Second year offered only at Berks.
- (4) Begins summer session only.
- (5) Second year offered only at New Kensington, Schuylkill, and Worthington Scranton.
- (6) Second year offered only at Beaver.
- (7) Second year offered only at Fayette.
- (8) Second year offered only at Delaware County, McKeesport, and Wilkes-Barre.
- (9) This program is not currently being offered to entering students.

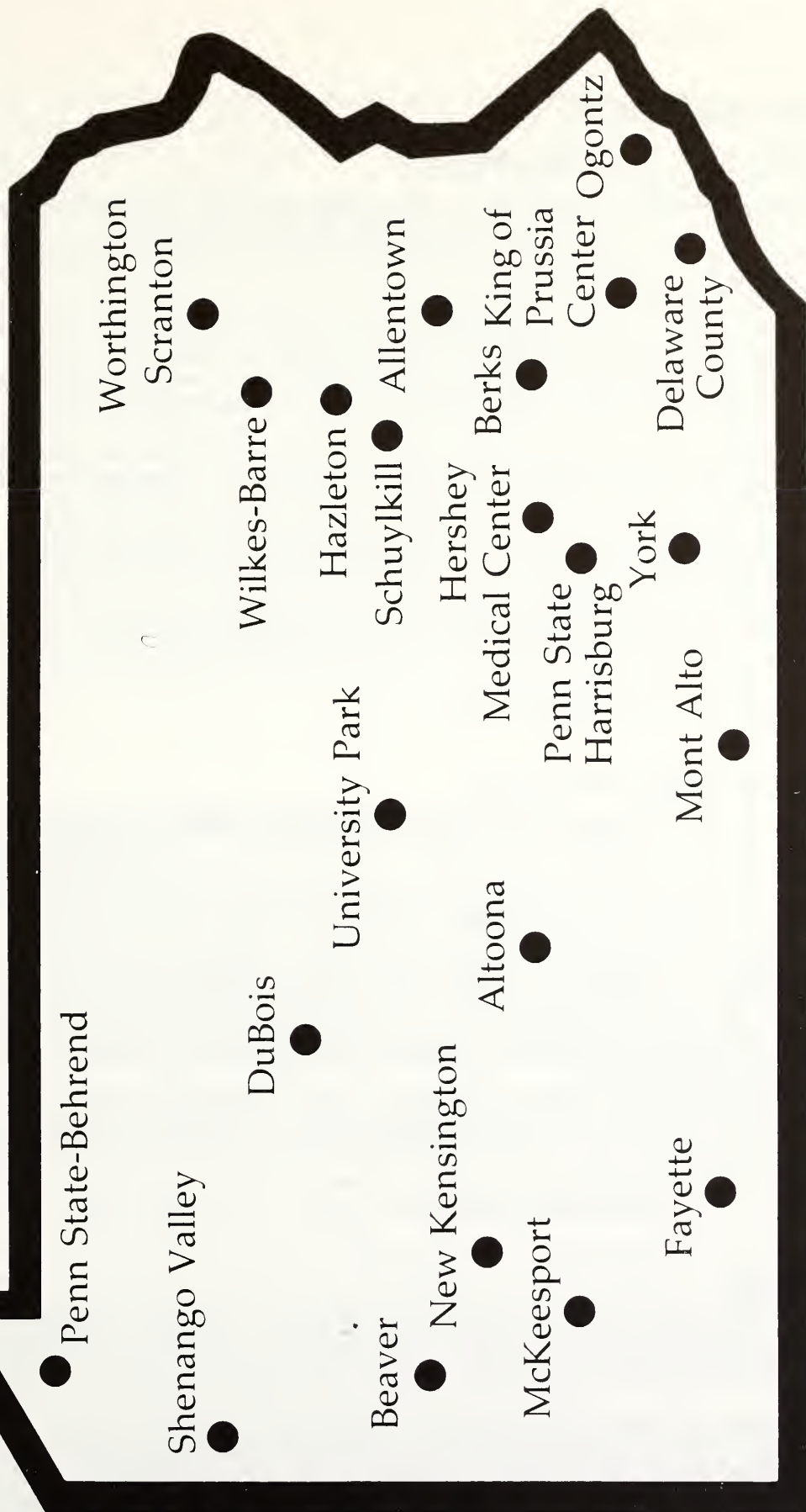
† The two-year Business Administration major offered at Berks College, Hershey Medical Center, Ogontz, and University Park for nontraditional students who want to pursue part-time (evening) study.

‡ Programs offered at Hershey Medical Center are intended for nontraditional students who want to pursue part-time (evening) study. Interested students should write to the Continuing Education Office, Department 4006, 205 Eastmoor Building, P.O. Box 17033, Hershey, PA 17033.

* The two-year majors in Community Services, Labor Studies, and Sociology are offered as *extended degree* programs for students who want to pursue part-time (day or evening) study. The two-year Letters, Arts, and Sciences also may be taken as an *extended degree* program at all University locations. Interested students should contact the Admissions Office or the nearest Penn State campus to request a special application for extended degree programs.

+ This program has special admission requirements including graduate credits from a regionally approved college or university. Therefore, this program is not open to freshman.

This program is available primarily through the Department of Independent Learning. Interested students should write to the Independent Learning Admissions Office at University Park, the Continuing Education Office at the nearest Penn State campus, or the Department of Independent Learning, 128 Mitchell Building, The Pennsylvania State University, University Park, PA 16802 for more information. request a special application for extended degree program.



THE UNIVERSITY

MISSION OF THE UNIVERSITY

Penn State's fundamental responsibility is to provide programs of instruction, research, and public service, and thus act as an instrument of self-renewal and development for the Commonwealth. As Pennsylvania's land-grant university, Penn State must preserve and enhance its distinctive qualities.

While the modern university maintains links to the past and serves to maintain cultural values, its most extensive task at present is to help people to understand the great changes taking place in our society. People must have the skills and the learning habits that will make it possible for them to educate themselves over a lifetime. The rapid rate of change in contemporary society dictates that the University's programs adjust without undue delay to meet the needs of students and society.

University programs of research and other creative and scholarly activities are essential if the University is to contribute to the solution of the social, scientific, and technical problems of society and discharge effectively its upper-division and graduate teaching responsibilities. The University must also serve the Commonwealth directly through its programs of extension, continuing education, and other public service programs designed to meet the needs of citizens throughout the state.

By encouraging the enrollment of students from all segments of society and from other states and nations, the University provides the intellectual arena in which the search for rational solutions to societal problems can be nurtured, and in which teaching and learning can be the pivotal function. In performing this function, it is essential that the University foster independent thought and open discussion of alternatives.

RESIDENT INSTRUCTION

The undergraduate degree programs of the University provide students with opportunities to increase their knowledge and understanding of the world, and to grow in their individual skills and capabilities for learning, analyzing, judging, creating, and communicating. All undergraduate degree programs and courses offered by the colleges and other degree-granting units of the University are under the academic sponsorship of a faculty committed to scholarship and are implemented under the academic policies and student rules established by the University Faculty Senate. They are intended to be flexible in accommodating students interested in learning, whether through traditional or nontraditional offerings, while enrolled on either a part-time or a full-time basis. The degree programs and courses of the colleges and other degree-granting units are offered through University administrative arrangements identified as Resident Instruction and Continuing Education.

The primary mission of Resident Instruction is to provide credit courses to degree candidates on University campuses as well as to administer certain off-campus credit-granting activities such as internships, practicums, field trips, and foreign studies. Students not formally admitted to degree candidacy (including provisional and nondegree students) may participate in Resident Instruction offerings as time and space permit.

HISTORY

THE PENNSYLVANIA STATE UNIVERSITY, chartered by the Pennsylvania legislature as the Farmers' High School in 1855, was founded by professional men, educated farmers, and state and county agricultural leaders. A faculty of 4 met the incoming class of 69 students in February 1859.

In May 1862, the institution was renamed the Agriculture College of Pennsylvania, a name that recognized that its work was of collegiate level. Two months later, on July 2, President Abraham Lincoln signed the Morrill Land Grant Act offering each state free public land that it could sell to endow institutions of higher learning where "the leading object shall be, . . . to teach such branches of learning as are related to agriculture and the mechanic arts . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

On April 1, 1863, the state legislature declared that the Morrill Act “is hereby accepted by the State of Pennsylvania with all its provisions and conditions and the faith of the State is hereby pledged to carry the same into effect.” The legislature then designated Penn State as the land-grant college of the Commonwealth.

The College broadened the scope of its instruction, began to admit women students, increase its enrollment, and enlarge its physical plant. Graduate work was offered as early as 1862. In 1874 the College was renamed the Pennsylvania State College.

In 1953 the name was changed again—to The Pennsylvania State University—in formal recognition of what Penn State had long since become, one of the country’s leading universities. Its nine undergraduate colleges and the School of Communications now offer 128 baccalaureate and 29 associate degree majors. Penn State Erie, The Behrend College, offers 24 complete baccalaureate programs. Penn State Harrisburg, The Capital College, offers 20 baccalaureate degree majors. Graduate students may choose from 138 approved fields of study. The College of Medicine, at The Milton S. Hershey Medical Center in Hershey, offers the M.D. degree, the M.S. and Ph.D. in anatomy, biological chemistry, cell and molecular biology, genetics, microbiology, neuroscience, pharmacology, and physiology, and the M.S. degree in laboratory animal medicine.

The original student body of 69 has grown to 67,278, the faculty of 4 to 4,069. Beginning with an educational program that offered 40 courses, Penn State today offers 5,317 undergraduate and 3,091 graduate courses and 183 medical courses. The University, whose prime purpose has always been to serve the people and the interests of the Commonwealth and the nation, is accredited by the Middle States Association and is a member of the Association of American Universities.

ACADEMIC ORGANIZATION OF THE UNIVERSITY

COLLEGES AND OTHER DEGREE-GRANTING UNITS

The University has nine colleges and one school that offer undergraduate majors leading to baccalaureate and associate degrees: College of Agriculture, College of Arts and Architecture, College of Business Administration, College of Earth and Mineral Sciences, College of Education, College of Engineering, College of Health and Human Development, College of the Liberal Arts, and College of Science. Additional degree-granting units of the University are the School of Communications; Penn State Harrisburg, The Capital College; and Penn State Erie, The Behrend College. Penn State Harrisburg and Penn State-Behrend provide an alternative educational setting in which students may enroll in selected degree programs.

THE COMMONWEALTH EDUCATIONAL SYSTEM

The Commonwealth Educational System is the administrative organization for the University’s system of Commonwealth Campuses and for the delivery of continuing education programs throughout the Commonwealth. Through the seventeen Commonwealth Campuses and the Continuing Education offices at University Park; Penn State Erie, The Behrend College; Penn State Harrisburg, The Capital College; Hershey; King of Prussia; and Williamsport, the Commonwealth Educational System offers a wide array of University courses and programs at locations convenient to virtually all of the population of the Commonwealth.

The Division of Technology of the Commonwealth Educational System, in cooperation with the College of Engineering, is administratively responsible for the associate degree majors in engineering offered at the Commonwealth Campuses. The division director is responsible for the coordination and leadership among the college, campuses, and local industry and provides a central advocate for the engineering technology programs.

COMMONWEALTH CAMPUSES—In addition to the University Park Campus in the municipality of State College, Penn State Erie, The Behrend College, and Penn State Harrisburg, The Capital College, full-time instruction is available at seventeen Commonwealth Campuses: Allentown (Fogelsville), Altoona, Beaver (Monaca), Berks (Reading), Delaware County (Media), DuBois, Fayette (Uniontown), Hazleton, McKeesport, Mont Alto, New Kensington, Ogontz (Abington), Schuylkill (Schuylkill Haven), Worthington Scranton (Dunmore), Shenango Valley (Sharon), Wilkes-Barre (Lehman), and York.

TWO-YEAR ASSOCIATE DEGREE MAJORS

Majors that lead to two-year associate degrees are available at Penn State Erie, The Behrend College, and all seventeen of the University's Commonwealth Campuses except Allentown as listed on page 10 of this bulletin. These majors provide concentrated instruction to prepare graduates for specialized occupational assignments, except for the Letters, Arts, and Sciences major, which provides graduates with a general education and some specialization in their fields of interest. In addition, a major in Dietetic Food Systems Management is available primarily through the Department of Independent Learning.

Twenty-nine associate degree majors lead to either the Associate in Arts degree, the Associate in Engineering Technology* degree, or the Associate in Science degree. The majors leading to these degrees are listed below.

Associate in Arts Degree

Labor Studies
Letters, Arts, and Sciences
Sociology

Associate in Engineering Degree

Architectural Engineering Technology +
Biomedical Equipment Technology +
Chemical Engineering Technology +
Electrical Engineering Technology +
Highway Engineering Technology +
Mechanical Engineering Technology +
Metallurgical Engineering Technology
Microcomputer Engineering Technology
Mining Technology
Nuclear Engineering Technology +
Railway Engineering Technology +
Solar and Thermal Technology +
Surveying Technology +
Telecommunications Technology +

Associate in Science Degree

Agricultural Business
Business Administration
Clinical Health Services
Community Services
Computer Science
Dietetic Food Systems
Management
Forest Technology
Hotel, Restaurant, and
Institutional Management
Medical Laboratory Technology
Physical Therapist Assistance
Science
Wildlife Technology

A description of the purposes, objectives, and content of each of the two-year majors is given on succeeding pages.

Most of Penn State's associate degree enrollment at present is concentrated in its engineering technology majors, the majority of which are accredited by the Technical Accreditation Commission, Accreditation Board for Engineering and Technology (TAC/ABET). Engineering technology is that part of the technological field that requires the application of scientific and engineering knowledge and methods combined with technical skills in support of engineering activities; it lies in the occupational spectrum between the craftsperson and the engineer at the end of the spectrum closer to the engineer. The engineering technology graduate, a specialist in applied rather than theoretical technology, is equipped to translate creative ideas into new machines, products, structures, and processes.

*Division of Technology, Commonwealth Educational System.

+ Accredited by TAC/ABET.

The Commonwealth Campuses and Penn State-Behrend also offer up to two years of work in most of the four-year baccalaureate degree majors offered by the University.

STATEMENT OF BASIC ACADEMIC ADMISSIONS POLICIES—Admission to the University credit courses or degree candidacy at The Pennsylvania State University is governed by policies established by the University Faculty Senate. Although specific applications of these policies may vary from year to year, from location to location, and from program to program, all University admissions are governed by the following general policies:

1. As an institution of higher education, The Pennsylvania State University is committed to making post-high school education available to all who possess a high school diploma or its equivalent without restriction as to race, sex, religion, color, ancestry, national origin, ethnic origin, or handicap or age as provided by law.
2. The primary responsibility of the University is to residents of the Commonwealth of Pennsylvania. Consequently, within limits expressed from time to time by the Board of Trustees of the University, preference shall be given to Pennsylvania residents in the various admission processes.
3. In order to meet the variety of goals and objectives of the population, the spectrum of offerings is designed to enable persons with a variety of objectives — both degree and nondegree — to receive higher education. Although access to educational opportunities of the University is open to all, courses offered for credit are available to those holding a high school diploma or its equivalent. Policies governing admission to degree candidacy are established by the University Faculty Senate (with delegation of policies governing admissions to graduate programs to the Graduate Faculty of the University) under a general policy of offering admission to those whose past academic performance indicates a reasonable probability of success.
4. Undergraduate students are admitted to either baccalaureate degree candidacy or associate degree candidacy. To be admitted to degree candidacy, the individual must present an academic performance record which indicates a reasonable probability of his or her success in his or her chosen program. In the case of freshman admission to undergraduate degree candidacy, performance is measured through the high school record and standardized test results. In the case of advanced standing admission, performance is measured either through success in nondegree programs and courses of the University or by success at some other institution of higher education.
5. Within the space available in particular programs and at particular locations, admission shall be offered preferentially to those whose performance record indicates the highest probability of success in the chosen program—with this process continuing until all available spaces are filled. Although exceptions to this policy may be made from time to time (for example, recipients of scholarships with restricting qualifications), these exceptions may be made only for students who meet at least the minimum admission and entrance requirements.
6. If a college or school requires restrictions on its baccalaureate admissions, the priorities or quotas established must include provisions to consider qualified students in each of these groups:

Admissions Group I—Freshman Admissions: Students who hold a high school diploma or equivalent, who present fewer than 18 credits of baccalaureate work (from The Pennsylvania State University or another accredited institution), who meet minimum college or school entrance requirements, and who meet minimum college or school admission standards are considered in this group.

Admissions Group II—The Pennsylvania State University Advanced Standing Admissions: Students who (1) request baccalaureate degree readmission, presenting 18 or more credits; (2) request a change from The Pennsylvania State University associate degree to baccalaureate degree status, presenting 18 or more applicable credits; or (3) request a change from The Pennsylvania State University provisional degree to baccalaureate degree status, presenting 18 or more applicable credits, are considered in this group. In all ad-

vanced standing admissions at The Pennsylvania State University, the student must have a G.P.A. of at least 2.00 and must meet the minimum entrance and advanced standing requirements of the college or school.

Admissions Group III—Other Advanced Standing Admissions: Students who (1) request changes from The Pennsylvania State University nondegree to baccalaureate degree status, presenting 18 or more applicable credits; or (2) have not been students at Penn State and request baccalaureate degree status at Penn State, presenting 18 or more applicable credits. In all advanced standing admissions it is understood that the student must have a G.P.A. of 2.00 as computed at Penn State and meet the minimum entrance and advanced standing requirements of the college or school.

Within these three groups, no special consideration will be given to any group; students will be admitted to the college or school on the basis of academic competition (e.g., SAT scores, grade-point averages, grades in required courses in the college or other degree-granting unit, and other evidence predictive of baccalaureate degree performance where available, valid, and reliable).

7. To assure a proper educational mix of students and to further broaden the educational opportunities offered by the University, the University Faculty Senate and the University administration from time to time may authorize various specialized programs. These programs may permit students who do not meet the basic qualifications for admission to degree candidacy to be admitted to such candidacy. These programs may also permit, in selected situations, exceptional students who have not earned a high school diploma or its equivalent to enroll in University credit courses. Such specialized programs may include up to 10 percent of the total admission group for the University in any one year and up to the maximum of 15 percent of the admission to any geographic location of the University.
8. Within this general policy, the colleges and school of the University, with the concurrence of the University Faculty Senate, may impose certain educational background requirements (Carnegie Units) that must be completed by an individual before being admitted to degree candidacy.

ADMISSION REQUIREMENTS—*Freshman Admission*—A person who holds a high school diploma or its equivalent and who has not taken credit courses at an institution of higher learning, or a person who holds a high school diploma or its equivalent and who has taken less than 18 semester credits at an accredited college or university, may be considered for admission as a freshman.

Applicants for admission to all associate degree programs must submit scores of the Scholastic Aptitude Test of the College Entrance Examination Board.

All applications should be addressed to the Undergraduate Admissions Office, 201 Shields Building, Box 3000, The Pennsylvania State University, University Park, PA 16802. Telephone: (814) 865-5471.

The University reserves the right to reject any applicant for admission for any reason the University determines to be material to the applicant's qualifications to pursue higher education.

An applicant must state in writing whether he or she has attended any other institution of higher learning, even though advanced standing is not desired. Failure to indicate, at the time of application, previous registration in another institution may result in refusal or cancellation of admission.

To be admitted to degree candidacy, the applicant must have completed certain educational background requirements, called Carnegie Units or secondary school units. To determine whether you have the appropriate secondary school units required for your choice of a program of study, refer to pages 21 and 22 to the program of your choice. Then read across to determine the necessary units.

Admission with Advanced Standing—An applicant who has attempted at least 18 semester credits at an accredited college or university and has a minimum cumulative grade-point average of at least 2.00 (on a 4.00 scale as computed at Penn State) for all graded courses at all colleges and universities previously attended may be considered for admission with advanced standing.

In all cases where work has been taken at other institutions, an official transcript from each

place of attendance must be submitted directly to the Undergraduate Admissions Office by the institutions attended. The latter must include evidence that the student was honorably dismissed and was in good academic standing at the time of leaving.

Advanced standing credits may be awarded for work taken at fully accredited institutions provided the grade earned is equivalent to a grade of A, B, or C at this university, and the credits are useful to the student's program of study. In certain circumstances, the University may need to restrict advanced standing admissions in particular programs because of space limitations.

Associate degree programs have a limit on the number of credits that may be accepted by transfer from accredited institutions. Information on credit limitations may be obtained from the academic official responsible for a particular program.

Credits are transferred, but grades and grade points are not. Advanced standing students enter the University without an average, and their average begins with the completion of their first semester of study at Penn State.

Provisional Student (Degree-Seeking)—An applicant seeking to pursue a degree program and holding a high school diploma or its equivalent but without the criteria required for admission as a degree candidate may enroll in credit courses at the University. A provisional student may enroll in credit courses if the following criteria are met:

1. The student is making satisfactory progress toward admission as a degree candidate. Progress is satisfactory if a student has earned 18 credits with a minimum grade-point average of 2.00 (on a 4.00 scale). If a student attempted 18 credits and earned less than 2.00, the student is given a warning. A student who has attempted 27 credits with a grade-point average of less than 2.00 will not be permitted to enroll as a provisional student in any subsequent semester. No student, regardless of cumulative grade-point average, who has completed 36 credits will be permitted to enroll as a provisional student in any subsequent semester.
2. There is space available after degree candidates have been accommodated.
3. The student has not been dropped for unsatisfactory scholarship from any college or university previously attended.
4. The student has not been dismissed or suspended for nonacademic reasons from any college or university. An applicant not in good standing at another accredited college or university for disciplinary reasons may petition for an exception to the policy.

A provisional student may apply to become an associate degree candidate after completing 9 credits of Penn State course work with a minimum grade-point average of 2.00. All these credits must be earned at this university. The applicant must also satisfy the entrance requirements of either the major in which enrollment is desired or of the Division of Undergraduate Studies if the student wishes to enroll in that division. An applicant who has completed at least the equivalent to one year's associate degree work before applying for admission as an associate degree candidate must have the approval of either the dean of the college or school in which enrollment is desired or of the director of the Division of Undergraduate Studies if the student wishes to enroll in that division. After a student is admitted as a degree candidate, the dean of the college or school of enrollment decides which credits earned as a provisional student may be used to fulfill the degree requirements.

Nondegree Student—Any person having received a high school diploma or its equivalent may be permitted to enroll in credit courses (either for credit or audit) at the University. Some of these persons will be classified as nondegree students.

A nondegree student who has not been dropped from degree or provisional status by this university or any other college or university for unsatisfactory scholarship will be listed as a nondegree-regular student and may enroll in any number of credits not to exceed the typical credit load of a full-time student per semester if criteria 1, 2, and 3 are met.

A nondegree student who has been dropped from degree or provisional status by this university or any other college or university because of unsatisfactory scholarship will be listed as a nondegree-conditional student and may enroll in a maximum of 10 credits per semester if criteria 1, 2, 3, and 4 are met.

GENERAL INFORMATION

1. The student has completed the prerequisites for the courses to be scheduled or has obtained permission from the instructor to schedule the course.
2. Space is available after degree candidates and provisional students have been accommodated.
3. The student has not been dismissed or suspended for nonacademic reasons from any college or university. An applicant not in good standing at another accredited college or university for disciplinary reasons must consult with the director of the Office of Conduct Standards for admissions clearance.
4. The student has obtained academic advising/counseling from an adviser/counselor designated by the academic unit to which admission, or reinstatement and readmission, is desired.

Note: A student must be admitted, or reinstated and readmitted, as a degree candidate to apply the credits earned as a nondegree student toward fulfilling the requirements for a degree. The dean of the college or school of enrollment shall decide which credits may be used to fulfill the degree requirements.

An individual desiring to take associate degree courses as a provisional student (degree-seeking) or nondegree student should submit the appropriate application for admission. An application can be obtained from the Undergraduate Admissions Office, 201 Shields Building, Box 3000, The Pennsylvania State University, University Park, PA 16802, or from the admissions officer at any Commonwealth Campus or Penn State Erie, The Behrend College.

PROGRAMS FOR NEW STUDENTS — The Office of Programs for New Students works to assure that freshmen at all Penn State campuses, as well as advanced standing and change of assignment students at University Park, are provided with a comprehensive introduction to the essential academic and student development opportunities of the campus and the university in general beginning with a new student's acceptance to a campus and continuing through completion of the new student's first semester.

Through the programs of this office, offered in cooperation with the colleges' academic units and various student service operations, new students are introduced to the intellectual and scholarly expectations of the University, to the skills needed for advanced study and lifelong learning, and to the student development opportunities with academic merit. In addition, this office provides a series of publications designed to introduce the University, to inform students of the required procedures for matriculation, and to offer a perspective on college life. These publications also give new students practical information about important dates, times, and locations (e.g., arrival day, first day of classes, course drop/add, etc.).

Many programs for new students are scheduled during arrival week each semester. During this period, new students receive instruction and counseling concerning their courses of study and participate in extracurricular and cultural activities. Registration is also held during arrival week.

BASIC SKILLS—The Basic Skills Program consists of both academic services and courses designed to bridge gaps between high school preparation and minimum college-level skills needed in introductory University courses. The primary goal of this program is to help students eliminate specific weaknesses (as indicated by FTCAAP placement scores) in English, reading, math, and other related learning skills areas.

All students entering the freshman class in an associate degree major are tested for basic skills in English composition and mathematics. Students identified with major weaknesses in English composition are required to enroll in ENGL 004 (3 credits) prior to scheduling ENGL 015.

ENGL 004 provides intensive practice in writing sentences and paragraphs as well as instruction in grammar, usage, and punctuation. If more practice is needed in this area, students are advised to schedule a 1-credit tutorial, ENGL 005, along with ENGL 004. Credits earned in ENGL 004 and 005 do not substitute for minimum program requirements designated under the

categories “General Education,” “Requirements for the Major,” and “Electives.” This stipulation also applies to the courses listed below in reading and in certain pre-calculus-level math courses.

Assistance in reading is available through a series of college reading improvement courses: RCLED 005 and 010. Each course is offered for 3 credits. Consult the course description section for a complete description.

Students with mathematics weaknesses are encouraged to strengthen these skills by reviewing the following topics: operations with rational numbers and decimals; applications involving ratio, proportion, and percent; factoring algebraic expressions; operations with polynomials; properties of exponents; solutions of linear equations and inequalities; operations with radical expressions; solution of quadratic equations and inequalities; graphing in the coordinate plane; and solution of systems of equations. While the Math Center is an excellent resource, several credit courses are available to assist in this review.

The Learning Center is available at University Park and most other campuses to offer assistance in the basic skill areas of writing, reading, and mathematics. This facility and its resources are open to any student who needs or wants such help. Most centers also provide help to develop and refine study skills, and most offer subject-area tutoring in entry-level college courses.

DIVISION OF UNDERGRADUATE STUDIES—This division is an academic unit of the University that offers at the Commonwealth Campuses, Penn State Erie, The Behrend College, and the University Park Campus the following programs and services:

Freshman Testing, Counseling, and Advising Program—All new freshmen admitted to the University are provided with comprehensive testing and academic advising prior to attending first-semester classes. The purpose of the program is to provide all new students with assistance in evaluating their educational plans and objectives.

Enrollment Program—New freshmen who prefer to test their abilities and interests or who want to explore several areas of study before identifying themselves with one of the University's colleges or other degree-granting units can request to begin their studies in the Division of Undergraduate Studies. At any time in their academic careers, students whose interests or career objectives change can request enrollment in 2-DUS (Division of Undergraduate Studies) until the time that they choose a new program and meet its academic standards for transfer.

Academic Advising Program—All students, whether or not they are enrolled in the Division of Undergraduate Studies, have available to them the professional advising, educational planning, and referral services provided by the division. Such services are a supplement to and are coordinated with the advisory services of the colleges and faculty. Provisional students are also advised by DUS.

Academic Information Program—The Division of Undergraduate Studies provides a comprehensive academic information support system throughout the University to assist faculty in their student advisory responsibilities. DUS academic advising and information centers are located at every Commonwealth Campus and in the colleges and other degree-granting units at University Park.

GRADING SYSTEM—The grades of A, B, C, D, and F indicate the following qualities of academic performance:

- A (EXCELLENT) Indicates exceptional achievement.
- B (GOOD) Indicates extensive achievement.
- C (SATISFACTORY) Indicates acceptable achievement.
- D (POOR) Indicates only minimal achievement. It indicates that the student may be seriously handicapped in carrying a more advanced course for which this course is a specific prerequisite.
- F (FAILURE) Indicates inadequate achievement necessitating a repetition of the course in order to secure credit.

GENERAL INFORMATION

The grades of A, A-, B+, B, B-, C+, C, D, and F indicate a gradation in quality from Excellent to Failure and are assigned the following grade-point equivalents:

| <i>Grade</i> | <i>Grade-Point Equivalent</i> |
|--------------|-------------------------------|
| A | 4.00 |
| A- | 3.67 |
| B+ | 3.33 |
| B | 3.00 |
| B- | 2.67 |
| C+ | 2.33 |
| C | 2.00 |
| D | 1.00 |
| F | 0 |

Grade points are determined by multiplying the grade-point equivalent of the grade earned by the number of credits for the subject; e.g., ENGL 015, 3 credits, with a grade of A (grade-point equivalent 4.00) yields 12 grade points.

GRADUATION REQUIREMENTS—In order to graduate, a student must complete the course requirements of the major and earn at least a C average (a grade-point average of 2.00) for all courses.

DEGREES—The associate degree majors outlined in this bulletin lead to the following degrees: Associate in Arts, Associate in Engineering Technology, and Associate in Science.

**SECONDARY SCHOOL UNITS REQUIRED FOR ADMISSION
CONSIDERATION TO ASSOCIATE DEGREE PROGRAMS
(Effective Through Spring 1989)**

| | English | Math. (D)* | Math. (E)+ | Math. (F)** | Science | Other Subjects |
|---|---------|------------|------------|-------------|---------|----------------|
| Agricultural Business | 3 | | | | | 12 |
| Architectural Engineering Technology | 3 | 2 | | | | 10 |
| Biomedical Equipment Technology | 3 | 2 | | | | 10 |
| Business Administration (2-year) | 3 | | 2 | | | 10 |
| Chemical Engineering Technology | 3 | 2 | | | | 10 |
| Clinical Health Services | 3 | | | 2 | 2+ + | 8 |
| Community Services | 3 | | | | | 12 |
| Computer Science | 3 | 2 | | | | 10 |
| Dietetic Food Systems Management | 3 | | | | | 12 |
| Electrical Engineering Technology | 3 | 2 | | | | 10 |
| Forest Technology | 3 | | 2 | | | 10 |
| Highway Engineering Technology | 3 | 2 | | | | 10 |
| Hotel, Restaurant, and Institutional Management | 3 | | | | | 12 |
| Labor Studies | 3 | | | | | 12 |
| Letters, Arts, and Sciences | 3 | | | | | 12 |
| Mechanical Engineering Technology | 3 | 2 | | | | 10 |
| Medical Laboratory Technology | 3 | 2 | | | 2+ + | 8 |
| Metallurgical Engineering Technology | 3 | 2 | | | | 10 |
| Microcomputer Engineering Technology | 3 | 2 | | | | 10 |
| Mining Technology | 3 | 2 | | | | 10 |
| Nuclear Engineering Technology | 3 | 2 | | | | 10 |
| Physical Therapist Assistance | 3 | | 1‡ | | 1# | 10 |
| Railway Engineering Technology | 3 | 2 | | | | 10 |
| Science (2-year) | 3 | 2 | | | | 10 |
| Sociology (2-year) | 3 | | | | | 12 |
| Solar and Thermal Technology | 3 | 2 | | | | 10 |
| Surveying Technology | 3 | 2 | | | | 10 |
| Telecommunications Technology | 3 | 2 | | | | 10 |
| Wildlife Technology | 3 | | 2 | | | 10 |

*Math. (D) requirements may be satisfied by at least 2 units of mathematics, including 1 unit of algebra and 1 additional unit of advanced algebra, plane geometry, solid geometry, or trigonometry.

+Math. (E) requirements may be satisfied by 2 units of mathematics. We recommend that the math units include 1 of algebra and 1 of plane geometry.

**Math. (F) requirements may be satisfied by 1 unit of algebra. We recommend 1 additional unit in mathematics.

+ +Biology and chemistry are recommended.

‡The 1 unit of mathematics should be in algebra. It is strongly recommended that 1 additional unit of mathematics be completed.

#The 1 unit of science should be in biology. It is strongly recommended that 1 additional unit of science be completed.

SECONDARY SCHOOL UNITS REQUIRED FOR ADMISSION
CONSIDERATION FOR ASSOCIATE DEGREE PROGRAMS
(Effective Summer 1989)

| TWO-YEAR DEGREE APPLICANTS | English | Math. (D)* | Math. (E) + | Math. (F)** | Science | Arts/Humanities/ Social Studies and Foreign Languages |
|--|---------|------------|-------------|-------------|---------|---|
| Agricultural Business | 4 | | | 2 | 2 | 5 |
| Architectural Engineering Technology | 4 | 2 | | | 2 | 5 |
| Biomedical Equipment Technology | 4 | 2 | | | 2 | 5 |
| Business Administration (2-year) | 4 | | 2 | | 2 | 5 |
| Community Services | 4 | | | 2 | 2 | 5 |
| Computer Science (2-year) | 4 | 2 | | | 2 | 5 |
| Dietetic Food Systems Management | 4 | | | 2 | 2 | 5 |
| Electrical Engineering Technology | 4 | 2 | | | 2 | 5 |
| Forest Technology | 4 | | 2 | | 2 | 5 |
| Hotel, Restaurant, and Institutional Management (2-year) | 4 | | | 2 | 2 | 5 |
| Letters, Arts, and Sciences | 4 | | | 2 | 2 | 5 |
| Mechanical Engineering Technology | 4 | 2 | | | 2 | 5 |
| Medical Laboratory Technology | 4 | 2 | | | 2++ | 5 |
| Metallurgical Engineering Technology | 4 | 2 | | | 2 | 5 |
| Microcomputer Engineering Technology | 4 | 2 | | | 2 | 5 |
| Nuclear Engineering Technology | 4 | 2 | | | 2 | 5 |
| Physical Therapist Assistance | 4 | | 2 | | 2# | 5 |
| Science (2-year) (including Radiologic Technologist Option) | 4 | 2 | | | 2 | 5 |
| Sociology | 4 | | | 2 | 2 | 5 |
| Solar and Thermal Technology | 4 | 2 | | | 2 | 5 |
| Surveying Technology | 4 | 2 | | | 2 | 5 |
| Telecommunications Technology | 4 | 2 | | | 2 | 5 |
| Wildlife Technology | 4 | | 2 | | 2 | 5 |

*Math. (D) requirements may be satisfied by at least 2 units of mathematics: 1 unit of algebra and 1 additional unit in any combination of advanced algebra, plane geometry, solid geometry, or trigonometry.

+ Math. (E) requirements may be satisfied by 2 units of mathematics: 1 unit of algebra and 1 additional unit of mathematics. Plane geometry is recommended.

**Math. (F) requirements may be satisfied by any 2 units of mathematics.

+ + Students entering Medical Laboratory Technology should have 1 unit each in biology and chemistry.

#Those entering Physical Therapist Assistance should have 1 unit in biology plus one other science course.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT THE UNIVERSITY PARK CAMPUS—Credits received for 800-series courses may be applicable to a particular baccalaureate degree program listed in the current baccalaureate degree bulletin of The Pennsylvania State University at the discretion of the appropriate college and major department.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT PENN STATE HARRISBURG, THE CAPITAL COLLEGE—In addition to receiving an education to prepare for employment, the graduate of an associate degree program may also qualify for admission to various programs leading to a baccalaureate degree from Penn State Harrisburg. Those anticipating admission to Penn State Harrisburg should inquire at that college's Admissions Office late in their freshman year or early in their sophomore year concerning baccalaureate degree course requirements.

Graduates from associate degree programs in Agricultural Business, Business Administration, Computer Science, or Dietetic Food Systems Management may want to consider further study at Penn State Harrisburg in a Business Administration baccalaureate degree program.

Graduates of the associate degree majors in Architectural Engineering Technology, Biomedical Equipment Technology, Chemical Engineering Technology, Electrical Engineering Technology, Highway Engineering Technology, Mechanical Engineering Technology, Metallurgical Engineering Technology, Mining Technology, Nuclear Engineering Technology, Railway Engineering Technology, Solar and Thermal Technology, Surveying Technology, and Telecommunications Technology may want to consider continuing at Penn State Harrisburg in an engineering technology major leading to a Bachelor of Science degree in Engineering Technology. Majors are offered in Electrical Engineering Technology, Energy Technology, Environmental Engineering Technology, Mechanical Engineering Technology, and Structural Design and Construction Engineering Technology.

Associate degrees in the following majors are also acceptable toward admission to baccalaureate degree majors at Penn State Harrisburg: Community Services; Forest Technology; Hotel, Restaurant, and Institutional Management; Labor Studies; Letters, Arts, and Sciences; Medical Laboratory Technology; Microcomputer Engineering Technology; and Sociology. Penn State Harrisburg programs related to these majors are offered by the college's Division of Humanities, Division of Behavioral Science and Education, and Division of Public Affairs.

Graduates of the associate degree majors in Science and in Computer Science may want to apply for admission to the baccalaureate degree major in Mathematical Sciences at Penn State Harrisburg.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT PENN STATE ERIE, THE BEHREND COLLEGE—Graduates of associate degree majors may also qualify for admission to a variety of baccalaureate degree majors at Penn State-Behrend. Students interested in applying to Penn State-Behrend should contact that college's Admissions Office or talk with Penn State-Behrend's dean representative at their campus.

Graduates of associate degree majors in either Business Administration or Computer Science may want to continue study in one of the following baccalaureate degree majors at Penn State-Behrend: Accounting, Business Economics, General Business, Management, or Management Information Systems. Students graduating with a two-year degree in Letters, Arts, and Sciences may want to consider any of a large number of majors offered by Penn State-Behrend in the liberal arts, sciences, and business.

Graduates of associate degree majors in Biomedical Equipment Technology, Electrical Engineering Technology, Microcomputer Engineering Technology, and Telecommunications Technology may want to continue their education in the baccalaureate degree major in Electrical Engineering Technology. Students receiving an Associate in Engineering Technology degree in Mechanical Engineering Technology may want to continue study in a baccalaureate degree major in either Mechanical or Plastics Engineering Technology.

EXTENDED BACCALAUREATE DEGREE PROGRAMS—Graduates of associate degree majors also may qualify for admission to one of the extended baccalaureate degree programs offered at the following Penn State campuses: B.S. in Administration of Justice at Berks and Fayette campuses; B.S. in Electrical Engineering Technology at Berks Campus; B.A. in General Arts and Sciences at Altoona, Beaver, DuBois, Fayette, McKeesport, New Kensington, and Shenango Valley campuses; B.S. in Engineering Technology at New Kensington and Wilkes-Barre campuses; and B.S. in Nursing at Beaver, Berks, Delaware County, Fayette, Hershey, McKeesport, New Kensington, Ogontz, and Shenango Valley campuses. For more information, contact the Admissions Office at the campus offering the program.

STUDENT WELFARE

STUDENT GOVERNMENT—Representative student leadership is provided on each campus of the University by a student government association that functions through officers and representatives elected from and by the student body. In addition to their involvement in student programs at their local campuses, student officers and delegates from University campuses convene several times annually. These meetings provide for an exchange of information among the various student government associations and for systemwide coordination in student government and student activities.

STUDENT CONDUCT—The Code of Conduct prohibits acts that interfere with the basic purposes or processes of the University, or with the rights, health, and safety of its members. Such acts include, but are not limited to, academic dishonesty, unethical and destructive behavior, and violation of rules and regulations. Violations of the code are subject to disciplinary action that may include separation from the University. Students, faculty, or staff may file complaints regarding student violations of the Code of Conduct with the Office of Conduct Standards at any University location.

INSURANCE PROTECTION WHILE ATTENDING THE UNIVERSITY—Any student who wants insurance protection while in attendance at the University (1) for accident and health and/or (2) for loss of property by fire or theft should arrange personally for whatever insurance seems desirable through an agency of his or her choice. Accident and health programs are available through the University Health Service.

HEALTH SERVICES—The University Health Service assists in promoting and maintaining the health of students.

Prior to their initial registration, all new full-time students entering the University must submit a medical history on a special form provided by the University. The completed form constitutes a vital part of the student's medical record.

The health services of the University are made available to students in accordance with a statement provided by each campus, pertinent to that campus, and published in its student handbook.

The University does not obligate itself for payment of medical services other than those provided by personnel employed or retained by the University and in facilities owned or contracted for by the University. Treatment provided in contract facilities must be authorized by the campus executive officer, the director of student programs and services, or the nurse.

Students are urged to protect themselves against medical expenses that may result from injury or illness by arranging for personal insurance coverage. An accident and sickness plan is available to all undergraduate students at a reasonable charge through the University Health Service.

DISABLED STUDENT SERVICES—The Pennsylvania State University encourages academically qualified disabled students to take advantage of its educational programs. It is the policy of the University not to discriminate against persons with disabilities in its admissions policies or procedures or its educational programs, services, and activities.

The University is responsible for making all of its programs and services available to all its students. In cases where it is necessary to provide auxiliary services and programs to meet the specific needs of disabled students, it is the responsibility of the coordinator of the Office for Disability Services to make reasonable accommodations. Examples of such accommodations available to those with special needs are sign language interpreters, accessible University transportation, and classroom and library assistance. Students anticipating the need for special services, both before and after enrollment, are encouraged to contact the coordinator of the Office for Disability Services at University Park (105 Boucke Building) or the director of student programs and services at other campuses.

CAREER DEVELOPMENT AND PLACEMENT—Career Development and Placement Services assists students in continual evaluation of their educational and career plans as they progress through college and helps them identify sources of personal or academic difficulty that may interfere with their progress. Individual as well as group educational and career counseling programs are available to students. A computerized guidance system, DISCOVER, is available for student use at each campus location.

A student programs and services staff member at each campus is responsible for providing placement assistance for associate degree graduates. Services include inviting employers to the campus to interview graduates for permanent employment, providing job information, and assisting students in preparing for the job search process. Career Development and Placement Services at the University Park Campus supplies prospective employers (national, state, and local) with information concerning the associate degree programs and works cooperatively with the Commonwealth Campuses in assisting graduates to locate suitable employment.

STUDENT AID

In addition to the student aid information provided below, students may want to consult the admissions booklet "It Takes Two" sent to all applicants and the "Penn State Student Financial Aid" brochure available upon request. Additional questions should be directed to the Office of Student Aid, 335 Boucke Building on the University Park Campus, or to the Office of Student Programs and Services at a Commonwealth Campus.

AID PROGRAMS AVAILABLE TO ASSOCIATE DEGREE CANDIDATES

GRANTS (aid sources not requiring repayment)

Pell Grant —The Pell Grant is the major federal grant program available to undergraduates. This award is available to undergraduates pursuing their first baccalaureate or associate degree on at least a half-time basis (6 credits per semester).

Pennsylvania Higher Education Assistance Agency Grant (PHEAA)—This is a grant established by the Commonwealth to assist undergraduates who have a financial need as defined by PHEAA guidelines. Applicants must be residents of Pennsylvania and enrolled full-time.

Note: Non-Pennsylvania students should contact their state higher education assistance agencies for information on state grants available for attending Penn State. Names and addresses of higher

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education assistance agencies are available from the Office of Student Aid, 335 Boucke Building, or the Office of Student Programs and Services at Commonwealth Campuses.

Supplemental Educational Opportunity Grant (SEOG)—This grant is available to undergraduates with high documented financial need. It is normally awarded in combination with the College Work Study Program or the National Direct Student Loan. Priority is given to students who appear to be eligible for the Pell Grant.

Penn State Academic Grant—This grant is awarded to students demonstrating academic excellence and high financial need. Students completing the application process for campus-based aid (NDSL, SEOG, CWSP) will be automatically considered for this grant.

LOANS

Guaranteed Student Loan Program (GSL)—The GSL is a federally subsidized loan program, available through banks, savings and loan associations, and other private lenders, which offers students attending on at least a half-time basis the opportunity to borrow money for their education. An undergraduate may borrow up to \$2,625 per year with a maximum of \$17,250 for undergraduate studies. Applications for GSLs are evaluated based on financial need; therefore, all students applying for a GSL must complete an appropriate need analysis document. Pennsylvanians may file the Pennsylvania State Grant and Federal Student Aid application while non-Pennsylvanians may file the Financial Aid form. Repayment begins six months after the termination of the student's education at an interest rate of 8 percent per year simple interest.

PLUS Loan—This is an educational loan available to parents of dependent undergraduate students. Similar to the GSL program, funds are provided by private lenders such as hometown banks, etc. The interest rate is 10.03 percent and the maximum dollar amount that can be borrowed per grade level is \$4,000. Repayment of the loan begins within sixty days. Student borrowers may defer repayment of principal until six months after termination of studies.

PHEAA Higher Education Loan Plan (HELP)—This plan may involve one or more loan programs. It combines the PHEAA nonsubsidized loan and the new PHEAA Alternative Loans with the federally subsidized student loan programs. Families can borrow the amount needed at the lowest cost. Families may borrow up to \$10,000 per year. Interest rates range between 8 and 10.03 percent annually, depending on the loan package selected. Applications are available from hometown lenders or directly from PHEAA. Non-Pennsylvanians can obtain applications from the Office of Student Aid.

Perkins Loan (formerly NDSL)—This program provides loans of up to \$1,500 per year with an overall maximum of \$9,000 for undergraduate students with documented financial need. Repayment starts nine months after termination of the student's education at an interest rate of 5 percent per year simple interest. Postponement of repayment and loan cancellation may be arranged for certain types of employment following graduation.

University Loans—University loans are funds established by donors to help students who have a documented financial need. These loans help needy students meet the educational and living expenses required to attain a college degree. Repayment at a simple interest rate of 6 percent per year starts immediately after the student completes his or her studies.

EMPLOYMENT

College Work Study Program (CWSP)—The CWSP is a form of federal aid that allows a student to earn a portion of the documented financial need through approved CWSP jobs. This is a nonrepayable source of aid since the student is paid an hourly wage for his or her employment.

Student Employment—Students who are interested in part-time employment on campus or in the State College area should contact the Student Employment Office, 335 Boucke Building, The Pennsylvania State University, University Park, PA 16802, or contact the Office of Student Programs and Services at Commonwealth Campuses. Earnings from University employment must, according to federal regulations, be considered an aid resource that will be counted toward meeting a student's financial need.

SCHOLARSHIPS

University Scholarships—University scholarships are awarded on the basis of superior high school or college academic performance and, in most cases, documented financial need. They are awarded either by the scholarship committees in the various academic colleges of Penn State, by the Freshman or Faculty Senate Scholarship Committee, or by the Commonwealth Campus Scholarship Committees.

HOW TO APPLY

After completing the application for admission to the University, each student seeking aid consideration should complete the forms necessary for each aid program being sought.

I. Aid Awarded by the Federal Government

Pell Grant

(All undergraduate students)

Students who have completed the application for Pennsylvania State Grant and Federal Student Aid or the Financial Aid Form (FAF) are considered for the Pell Grant program. After receiving the Student Aid Report (SAR), which designates eligibility for a Pell Grant, follow the instructions contained on the SAR to finalize the award. Applications are available from high school guidance counselors, the Office of Student Aid, or the Office of Student Programs and Services at Commonwealth Campuses. They should be completed as soon after January 1 as possible. Transfer students must request a Financial Aid Transcript to be sent to the Office of Student Aid, 335 Boucke Building, University Park, PA 16802, from each institution previously attended whether or not aid was received.

II. Aid Awarded/Coordinated by the States

PHEAA Grant (Pennsylvania residents only)

Other state grant/scholarship programs

Guaranteed Student Loan

PLUS Loan

PHEAA HELP (Higher Education Loan Plan)

(Undergraduates)

Pennsylvania residents should complete the application for Pennsylvania State Grant and Federal Student Aid. Students currently receiving PHEAA grants will receive renewal applications by mail from the PHEAA agency. Regular applications are available from high school guidance counselors, the Office of Student Aid, and the Office of Student Programs and Services at Commonwealth Campuses, in addition to the Pennsylvania Higher Education Assistance Agency. Applications should be completed as soon after January 1 as possible. Non-Pennsylvania students should contact their state's Higher Education Agency for information on aid programs available to them as Penn State students.

(PA and non-PA residents)

Contact a local bank or lending institution for application forms for the Guaranteed Student Loan Program and the PLUS Loan. Applications for PHEAA HELP are available by contacting hometown lenders or PHEAA directly. Non-Pennsylvanians may obtain appli-

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cations from the Office of Student Aid, 335 Boucke Building, University Park, PA 16802. Students should allow six to eight weeks for the processing of their loan application.

III. Aid Awarded by The Pennsylvania State University

Supplemental Educational Opportunity Grant (SEOG)
National Direct Student Loan (NDSL)
College Work Study Program (CWSP)
University loans and scholarships

(All students)

Complete the application for Pennsylvania State Grant and Federal Aid or the Financial Aid Form (FAF).

Note: Freshman students need only complete one of the above forms to be considered for aid awarded by Penn State. Both forms are available from high school guidance counselors, the Office of Student Aid, or the Office of Student Programs and Services at Commonwealth Campuses. The recommended filing date for consideration for aid is February 15; however, students are encouraged to submit applications as soon after January 1 as possible.

(All students except entering freshmen)

Complete the Office of Student Aid's Financial Aid Application. Students may indicate on this application the type of aid they are seeking, with the exception of University scholarships. File by April 1. The application is available from the Office of Student Aid or the director of student programs and services at Commonwealth Campuses.

(All students except entering freshmen)

Complete the University Scholarship Application. Since funds are limited, applications are only encouraged from those students with a cumulative grade-point average of 3.00 or higher. File by April 1. This application is available from the Office of Student Aid or the director of student programs and services at Commonwealth Campuses. Because many scholarships are awarded based on a combination of merit and financial need, students may want to complete an appropriate need analysis document such as the Pennsylvania State Grant and Federal Student Aid application or the Financial Aid Form. These forms are also available from the Office of Student Aid or the Office of Student Programs and Services at Commonwealth Campuses.

(Transfer students only)

Complete a Financial Aid Transcript. It is necessary for the University to know if you received aid at any other institution prior to enrolling at Penn State. Request this form from the Office of Student Aid. A Financial Aid Transcript must be submitted from all schools previously attended whether or not aid was received.

IV. Private Aid Sources

All students are urged to explore local scholarship/grant opportunities as well as any private low-interest loan funds offered by local employers and civic organizations.

HOW MUCH DOES IT COST TO ATTEND PENN STATE?

One of the major concerns of students and their parents is knowing how much it will cost to attend Penn State for an academic year. The following itemized listing of expenses, although prepared for the 1987-88 academic year, may be used as a basic guide for your planning. Students may find that some of the costs vary according to individual needs and circumstances.

STUDENT BUDGET — 1987-88

| | <i>Residence Halls or Off-Campus Housing (All Campuses)</i> | <i>Living at Home</i> |
|---|---|-------------------------------|
| Commonwealth Campus Tuition | \$3,126.00* | \$3,126.00* |
| Room & Board | 3,050.00 | 1,100.00 |
| Books & Supplies | 360.00 | 360.00 |
| Clothing & Laundry, Transportation, Personal Maintenance, Medical, & Recreation | 1,950.00 | 2,450.00 |
| Total* | <u>\$8,486.00</u> | <u>\$7,036.00</u> |

*For non-Pennsylvania residents, the nonresident undergraduate tuition figure of \$6,610.00 should be substituted. The total estimated budget for an out-of-state undergraduate student at the University Park Campus or a Commonwealth Campus is \$11,970.00.

For Pennsylvania residents, the 1987-88 undergraduate tuition at the University Park Campus, Penn State Harrisburg, The Capital College, and Penn State Erie, The Behrend College, is \$3,292.00.

STUDENT AID POLICIES

The Office of Student Aid at Penn State administers and coordinates the aid programs according to applicable federal and state regulations and University policies that guarantee each student equal access to financial assistance. The Office of Student Aid employs the standard need analysis services of the College Scholarship Service and the Pennsylvania Higher Education Assistance Agency to assess the aid eligibility of student applicants, ensuring equity of treatment among all applicants.

Eligibility for aid is contingent upon the student's financial need for assistance to meet educational costs. Each program has specific eligibility requirements that must be met before funds are awarded. In addition to financial need as a criterion for receiving aid, a student must be enrolling as a degree or provisional student. Nondegree students are not eligible to receive aid at Penn State. The University may require an official copy of the Federal Income Tax Form 1040 to verify eligibility for aid.

The Office of Student Aid assumes that all aid applicants will keep apprised of all application deadlines pertaining to the aid sources they are seeking. Because limited funds are available, applications filed after the applicable deadline dates are considered only as funds permit. On-time applicants receive first consideration. Some aid programs have flexible application deadlines that permit students to receive consideration at most times during the year (for example, the GSL and Pell Grant programs). Current and prospective aid recipients are strongly encouraged to keep well informed of aid application procedures through aid publications, news media, and agencies providing aid information such as the Office of Student Aid at University Park and the Office of Student Programs and Services at Commonwealth Campuses.

Aid is never automatically awarded for subsequent years. Students must reapply each year for funds. Students who plan to attend the summer session must file separate applications to be considered for almost all aid programs. The major exceptions to this requirement are as follows:

1. Entering freshmen seeking aid awarded by the University (see "How to Apply" above) must file only the application for Pennsylvania State Grant and Federal Student Aid or the FAF to receive consideration for the summer session if they have been admitted to the University specifically to begin during the summer session; and
2. The Pell Grant program has no separate summer application and is generally awarded to students during the fall-spring academic year. (Pell Grant recipients not attending the entire fall-spring year should contact the Office of Student Aid to determine if a summer payment is possible.)

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One of the goals of the Office of Student Aid is to help financial aid recipients receive a financial aid package that will attempt to meet the student's documented financial need. The financial aid package can be composed of federal aid, state grant monies, private award sources, or any other source of funds available to the student, including earnings from University employment.

It is the responsibility of the Office of Student Aid, however, to assure the federal government that federal aid recipients will not be permitted to retain financial aid *exceeding* the students' need. Students should be aware that if the aid received is in excess of need, they will be notified of their responsibility to return the excess amount to the University.

FEDERAL STUDENT ASSISTANCE SATISFACTORY ACADEMIC PROGRESS STANDARD

Satisfactory academic progress must be maintained for continued consideration for federal financial assistance at Penn State. Students must comply with the following to insure continued consideration:

1. Minimum standards for satisfactory scholarship established by Senate Policy Section 54-54 of the *Academic Policies and Procedures for Undergraduate Students* published in the *Policies and Rules for Students*.
2. Associate degree candidates must complete a minimum of 26 credits per academic level.
3. Students falling below this minimum by no more than 10 credits will be granted one probationary period (two semesters) to attain the minimum earned credit requirement while retaining aid eligibility.
4. When a student falls below this probationary level, the student becomes ineligible for aid.
5. While ineligible, federal aid is denied until the appropriate credit expectation has been reached for the next academic year.
6. Complete the requirements for the associate degree within six semesters.

Exceptions to the above and information concerning reinstatement of aid, course audits, deferred grades, and course repeats can be obtained by contacting the Office of Student Aid, 335 Boucke Building. Copies of the Federal Student Assistance Satisfactory Academic Progress Standard are available from the Office of Student Aid at University Park or the Office of Student Programs and Services at the Commonwealth Campuses.

SELECTIVE SERVICE REGISTRATION COMPLIANCE

Educational institutions are now required by law to collect a Statement of Registration Compliance from every federal financial aid recipient whether male or female. This attests to their status with the Selective Service. Disbursement of federal financial aid funds cannot occur until the Statement of Registration Compliance is on file with the Office of Student Aid. This requirement applies to Perkins (NDSL) Loan, SEOG, CWSP, Pell, GSL, and PLUS/SLS programs.

DEFAULT STATEMENT

Educational institutions also are required by law to collect a Default Statement from every federal financial aid recipient. This certifies that the student is not in default on any loan made under the GSL, PLUS/SLS, Consolidation, Income Contingent, or Perkins (NDSL) Loan programs and that he/she does not owe a refund on a grant received under the Pell Grant, SEOG, SSIG, or Byrd Scholarship programs. Disbursement of federal aid funds cannot occur until the Default Statement is on file with the Office of Student Aid. This requirement applies to the Perkins (NDSL) Loan, SEOG, CWSP, Pell, GSL, and PLUS/SLS programs.

ESTIMATED TUITION, ROOM, BOARD, AND OTHER CHARGES

NOTE: The University reserves the right to revise tuition, room, board, and other charges without further notice. Tuition and charges for baccalaureate and graduate programs are listed separately in the Baccalaureate Degree Programs, Graduate Degree Programs, and Penn State Harrisburg, The Capital College, bulletins. Penn State has two semesters and a summer session. Students normally attend two semesters per year. The tuition and charges set forth below are for the 1987-88 academic year. The actual tuition and charges for the 1988-89 academic year will be established prior to the beginning of the fall semester of the academic year.

TUITION—Tuition per semester for associate degree students in 1987-88:

| | <i>Pennsylvanians</i> | <i>Non-Pennsylvanians</i> |
|--|-----------------------|---------------------------|
| 12 or more credits: | | |
| University Park Campus | \$1,646.00 | \$3,305.00 |
| Commonwealth Campuses | 1,563.00 | 3,305.00 |
| Penn State-Behrend | 1,646.00 | 3,305.00 |
| 11 or fewer credits: | | |
| University Park Campus—rate per credit | 137.00 | 276.00 |
| Commonwealth Campuses—rate per credit | 119.00 | 276.00 |
| Penn State-Behrend—rate per credit | 137.00 | 276.00 |

Enrollment Charge—All entering students who plan to enroll for 12 or more credits are required to pay a nonrefundable enrollment charge of \$75 upon acceptance of an offer of admission.

General Deposit—Undergraduate students are required to make a general deposit of \$75 at the time of admission. This deposit will serve to safeguard the property and equipment used by students in their course of study. It will be retained until a student withdraws or is graduated.

The deposit, less any charges for equipment damages, losses, and forfeitures, will be refunded early in the subsequent semester to the student who has withdrawn or been graduated. The refund will be made by check and mailed to the student's home address. If at any time the balance of the deposit falls below the minimum amount of \$15, the deposit must be replenished.

Credit by Examination—A charge of \$30 per credit is made for credit by examination. For evaluation of credits completed elsewhere, a charge of \$35 is made for those applying for admission and a charge of \$3 for those who are already matriculated.

Student Activities—Student activities charges are determined by elected representatives of the student body, together with a faculty representative.

Certification and Verification Fee—A charge of \$2 is made for each request for verification or certification of enrollment.

Change of Schedule Charge—Unless a change is necessitated by the University, a charge of \$6 is made for each change of schedule after the first five working days of a semester.

Late Registration Charge—Unless the delay is unavoidable, \$10 is charged a student who fails to register on the appointed day.

Other Expenses—Books and supplies must be secured by the student. These vary from approximately \$125 per semester, depending upon the program.

TERMS OF PAYMENT—Tuition and charges, including room and board, are due and payable in advance of each semester at the Office of the Bursar, 103 Shields Building, The Pennsylvania State University, University Park, PA 16802. Registration for courses is not complete until an estimated bill is processed.

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Approximately six weeks in advance of each semester, the University will mail to each continuing and newly admitted degree student of record an estimated bill for tuition and, where applicable, residence hall charges. Payment by mail is encouraged before the established deadline. The receipt is returned to the student by mail. If checks tendered for payment of tuition and charges are not paid upon presentation to the maker's bank, the student will automatically incur the late payment fee of \$25, and the receipt previously mailed will be considered null and void.

Any student who does not fulfill payment of obligations by the deadline established may be charged the late payment fee of \$25. This charge for late payment also applies to unpaid student supplemental charges. Students whose accounts are delinquent for more than ten days are subject to suspension from the University.

The University reserves the right to withhold transcripts and services to any current or former student who has an unsatisfied financial obligation to the University.

WITHDRAWALS, COURSE DROPS, AND REFUNDS—Refunds of tuition for withdrawals are based on the date of last class attended.

Charges for tuition are refundable upon withdrawal from the University only in the event the student obtains an official withdrawal form at the office of the dean of his or her college or other degree-granting unit and presents it at the Office of the Registrar not later than one calendar month after the date of last class attended.

In the event of withdrawal, charges for tuition will be refunded under the following policy:

Refund of 80 percent upon withdrawal before the end of the first week of the semester (seventh consecutive calendar day from the first day of classes) and a decrease of 10 percent for each week thereafter up to and including the eighth consecutive calendar week. No amount will be refunded for withdrawal after the eighth consecutive calendar week of the semester.

If a student is enrolled for 12 or fewer credits and drops 1 or more credits, refunds will be determined on the effective date of the drop using the same refund percentage listed above under withdrawal.

For refund information for courses other than those taken for fifteen weeks, contact the fee assessor in 109 Shields Building.

Any refund policy related to adjustments in room and board will be a part of the housing contract.

PENNSYLVANIA RESIDENCE

The policy for determination of a student's Pennsylvania resident status is as follows:

A. *Pennsylvania Classification*—A student shall be classified as a Pennsylvania resident for tuition purposes if that student has resided in the Commonwealth for at least one calendar year before enrolling at The Pennsylvania State University.

1. A student who does not have continuous residence in Pennsylvania for a period of twelve months immediately preceding enrollment at The Pennsylvania State University is presumed to be a non-Pennsylvanian for tuition purposes.
2. A student attempting to obtain classification as a Pennsylvania resident for tuition purposes must be a citizen of the United States or must have indicated by formal action his/her intention to become a citizen or must have been admitted to the United States on an immigrant visa. A student admitted to the United States on a tourist or student (nonimmigrant) visa is not eligible for classification as a Pennsylvania resident for tuition purposes.
3. A student under the age of twenty-one is presumed to have the residence of his/her parent(s) or legal guardian.
4. A United States government employee or member of the armed forces who was a resident of Pennsylvania immediately preceding his/her entry into government service and who has continuously maintained Pennsylvania as his/her legal residence will be presumed to be a Pennsylvania resident.

5. A student receiving a scholarship, guaranteed loan, grant, or other form of financial assistance dependent upon residence in a state other than Pennsylvania is not a Pennsylvania resident for tuition purposes.
- B. *Reclassification of Residency***—A student requesting reclassification as a Pennsylvania resident for tuition purposes must demonstrate by clear and convincing evidence that his/her permanent residence is in Pennsylvania. Each case shall be decided individually on the basis of all facts submitted by the petitioner. While it is not possible to require a given number of factors or a specific set of circumstances, the following may be considered convincing evidence when presented by those petitioning for reclassification as Pennsylvania residents for tuition purposes.
1. Purchase of a permanent, independent residence. This must be the principal residence of the student and/or his/her parent(s) or guardian.
 2. Payment of applicable state and local taxes on income earned either as a resident or outside the Commonwealth and the filing of appropriate returns for such taxes.
 3. Financial self-support and emancipation: Students who claim financial self-support or emancipation should provide the following evidence to support their claim:
 - a. Complete financial disclosure with appropriate evidence to indicate sufficient income to provide minimum funds for tuition, living, and related expenses as determined by the University's Office of Student Aid.
 - b. Copy of latest Pennsylvania and federal personal income tax returns.
 - c. Sworn statement from parent(s) or legal guardian that the student will not be claimed as a dependent on current or future federal income tax returns.
 4. Presentation of clear and convincing evidence that although the parent(s) or guardian on whom the student is dependent resides or has moved outside the Commonwealth, the student has maintained continuous residence in the Commonwealth for a period of at least one year prior to enrolling at the University and continues to maintain such separate residence.
 5. The student may submit evidence of any other facts believed to be relevant to the reclassification request, such as evidence of full-time employment in Pennsylvania or registration to vote.
- C. *Reclassification Procedure***
1. A student may challenge his/her residence classification by filing a written petition with the person or committee designated to consider such challenges at the University. Such person or committee shall consider such petition and render a timely decision.
 2. Any reclassification resulting from a student's challenge or appeal shall be effective at the beginning of the semester or session during which the challenge or appeal was filed or at the beginning of the following semester or session. The decision as to which semester or session becomes the effective date shall rest with the person or committee rendering the decision on reclassification.
 3. A student who changes his/her place of residence from Pennsylvania to another state is required to give prompt written notice of this change to the University and shall be reclassified as a non-Pennsylvanian for tuition purposes effective with the date of such change.
 4. A dependent resident student whose parent(s) or guardian(s) move outside of the Commonwealth may remain a Pennsylvania resident for tuition purposes if he/she continues to maintain a separate residence within the Commonwealth.

NONRESIDENT STUDENT CLASSIFICATION

- A.** A student is initially classified as a nonresident based on information provided by the student when applying for admission to the University. The initial classification is made as follows:
1. Undergraduate Student
 - a. Penn State Harrisburg, The Capital College—Academic Services Officer
 - b. All other locations—Undergraduate Admissions Office, University Park, Pennsylvania

MAJORS

2. Graduate Student
 - a. Penn State Harrisburg, The Capital College—Academic Services Officer
 - b. All other locations—Dean of the Graduate School
 3. Medical Student
Milton S. Hershey Medical Center—Office of Student Affairs
- B. A student may challenge his/her residency classification by filing a written petition as follows:
1. Undergraduate Student
 - a. Penn State Harrisburg, The Capital College—Penn State Harrisburg Financial Officer
 - b. All other locations—Fee Assessor
 2. Graduate Student
 - a. Penn State Harrisburg, The Capital College—Penn State Harrisburg Financial Officer
 - b. All other locations—Fee Assessor
 3. Medical Student
Milton S. Hershey Medical Center—Controller
- C. The appropriate University official reviews the student's petition and makes a residency decision.
- D. The student may appeal that officer's residency decision to the University Appeals Committee on Residence Classification having representation from the Controller's Office, Undergraduate Admissions Office, and Graduate School. The committee's decision on appeal shall be final.

MAJORS

GENERAL EDUCATION

The University Faculty Senate, at its meeting on April 30, 1985, adopted the following statement as a comprehensive definition of general education:

General Education is the breadth of knowledge involving the major intellectual and aesthetic achievements of humanity. This must include understanding and appreciation of the pluralistic nature of knowledge epitomized by the natural sciences, mathematics, social-behavioral sciences, humanities, and the arts. General Education aids students in developing intellectual curiosity, strengthened ability to think, and a deeper sense of aesthetic appreciation. General Education, in essence, aims to cultivate a knowledgeable, informed, literate human being.

An effective General Education program enables students to:

1. acquire knowledge through critical reading and listening;
2. analyze and evaluate, where appropriate in a quantitative manner, the acquired knowledge;
3. integrate knowledge from a variety of sources and fields;
4. make critical judgments in a logical and rational manner;
5. recognize and comprehend the role of physical activity in meeting the demands of daily living;
6. learn to communicate effectively;
7. comprehend the reality of international interdependence and cultural diversity;
8. comprehend the role of aesthetic and creative activities in meeting the demands of daily living.

Courses taken to meet General Education program requirements may not be taken under the Satisfactory-Unsatisfactory option.

The General Education program for Penn State associate degree students consists of 21 credits distributed among communication and quantification skills (6 credits), the distribution areas (12 credits), including breadth and depth courses in the natural sciences (3 credits), arts (3 credits), humanities (3 credits), and social and behavioral sciences (3 credits), and an additional 3 credits in any General Education area.

Opportunities for qualified students to substitute advanced courses for courses on the breadth and depth lists are indicated below.

A. Breadth Courses

Breadth courses introduce and integrate major areas of knowledge, presenting the most fundamental and universal concepts, issues, and achievements in the discipline or cluster of disciplines. They represent the offering unit's special effort to help a wide range of students obtain coherent overviews of major findings and modes of investigation. While each breadth course stimulates further interest in the discipline(s), it may be, for many students, the only course taken in the discipline(s). Each breadth course, therefore, develops for such students a substantial, nonspecialized appreciation for the primary ways in which the discipline or cluster of disciplines contributes to a useful understanding of the human condition and/or its environment.

1. *Natural sciences breadth courses* emphasize the order, diversity, and beauty of nature, the concepts in the disciplines most useful to an informed citizenry, and how scientific understanding can bear on the formulation of individual and social values. The courses promote understanding of the inductive and deductive reasoning processes and develop a student's ability to reason inductively and deductively.

Scientific and technical disciplines require more advanced courses in basic sciences as essential foundations for further study in a range of majors. Such courses, which assume an already developed sense of the "general" aspects of the field, may be substituted for natural sciences breadth courses in any major.

2. *Arts breadth courses* emphasize how the traditions, literature, and history of the arts and architecture express the cultural values of society. These courses introduce major figures, ideas, and artistic achievements in coherent patterns across substantial chronological ranges. They examine the terminology, techniques, attitudes, ideas, and skills that compose the arts areas, so students can understand the approaches to human existence that distinguish the arts.
3. *Humanities breadth courses* emphasize coherent overviews of cultural and intellectual currents shaping or interpreting individual and social values. In thematically coherent patterns, they relate major figures, ideas, achievements, and/or world-shaping events to the most enduring continuities in human experience. Breadth courses in history, literature, philosophy, religion, and interdisciplinary humanities explore these topics across substantial chronological ranges, consistently relating the past to the present.
4. *Social and behavioral science breadth courses* emphasize major concepts, findings, and analytic methods most useful to an informed citizenry that needs to understand politics, economic systems, social institutions, individual and group behavior, and human communication. Such courses emphasize how an understanding of the multiple nature of causality in social settings can bear on the formulation of individual and social values.

B. Depth Courses

Depth courses, while emphasizing the same concepts as the breadth courses, are narrower in scope. Depth courses provide opportunities to pursue selected major concepts, issues, and achievements in more detail than is possible in breadth courses. Depth courses also emphasize how a particular focus, whether on the past or present, is relevant to current individual, social, and/or scientific issues. The varying degrees of specialization in depth courses extend or deepen the perspectives, knowledge, and analytic skills emphasized in breadth courses.

AGRICULTURAL BUSINESS

Listed depth courses are generally numbered below the 200 level. A student who has developed general interests and competencies in any of the four distribution areas may, in consultation with an adviser and with the approval of the student's college dean, substitute 200- to 499-level courses for those on the list of depth courses.

Courses to be Used for General Education

A. Skills (6 credits)

1. **WRITING/SPEAKING (3 credits)**
Courses designated with the suffix GWS satisfy this component.
2. **QUANTIFICATION (3 credits)**
Courses designated with the suffix GQ satisfy this component.

B. Distribution Component (12 credits)

Both breadth and depth courses satisfy this component. Students must take at least 3 credits of breadth courses in each of the four areas of the distribution component.

1. *Breadth courses* are identified by the suffix G followed by a letter code corresponding to each of the distribution areas.
 - a. Natural sciences breadth courses (GN)
 - b. Arts breadth courses (GA)
 - c. Humanities breadth courses (GH)
 - d. Social and behavioral sciences breadth courses (GS)
2. *Depth courses* are identified by the suffix D followed by a letter code corresponding to each of the distribution areas, e.g., depth courses in the natural sciences carry the suffix DN. A student may, in consultation with the adviser and the approval of the student's college dean, substitute 200- to 499-level courses for those on the list of depth courses.
 - a. Natural sciences depth courses (DN)
 - b. Arts depth courses (DA)
 - c. Humanities depth courses (DH)
 - d. Social and behavioral sciences depth courses (DS)

Students whose academic majors are in the areas of natural sciences, arts, humanities, and social and behavioral sciences may not meet the General Education program components by taking courses in the department or program *identical* to that of the academic major. All general education courses are to help students explore and integrate information beyond the specific focuses of their major.

RESERVATIONS—The University reserves the right to make such program or class changes as may become necessary because of insufficient enrollment or other contingencies. The University also reserves the right to make any necessary changes in tuition and charges without prior notice. Courses and programs described and listed in this bulletin are also subject to change without notice.

AGRICULTURAL BUSINESS (2 AGB)

NEIL GINGRICH, *in charge*

The Agricultural Business major prepares students for employment in commercial agriculture and businesses serving agriculture. Three options allow students to specialize in either crop or livestock production or in agricultural business, which provides training in management, business organization, and sales.

The first two semesters are offered at selected Penn State campuses where students fulfill basic course requirements in accounting, business, English, and natural and social sciences. The sec-

ond year at the University Park Campus provides course work in livestock and crop production, management, and agricultural business. As part of the requirements, there are supporting courses in agricultural engineering, farm management, agricultural marketing and sales. Each option allows the student a choice of electives to satisfy special interests and needs.

Graduates of the Agricultural Business major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Business Administration, Humanities, or Public Policy offered at Penn State Harrisburg, The Capital College.

For the Associate in Science degree in Agricultural Business, 68 credits are required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015(3); SPCOM 100(3); BIOL 101(4), 102(4); ENGL 202A(3) or 3 credits selected from speaking or writing. Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 45 credits

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 9 credits

PRESCRIBED COURSES (9 credits)

| | | |
|---|---|---|
| ACCTG 101(3), B LAW 243(3), CHEM 011(3) | x | — |
|---|---|---|

REQUIREMENTS FOR THE OPTION: 36 credits

ANIMAL PRODUCTION OPTION: 36 credits

PRESCRIBED COURSES (18 credits)

| | | |
|---|---|---|
| AG E 214(3), AGRO 028(3), 200(3), AN SC 100(3), 202(3), PTYSC 201(1), 202(2) | — | x |
|---|---|---|

ADDITIONAL COURSES (6 credits)

| | | |
|---------------------------|---|---|
| AG EC 101, 106, or 208(3) | — | x |
| AN SC 007 or 201(3) | — | x |

SUPPORTING COURSES AND RELATED AREAS (9 credits)

| | | |
|--|---|---|
| Select 6 credits in agricultural economics | — | x |
| Select 3 credits in agricultural engineering | — | x |
| ELECTIVES (3 credits) | — | x |

CROP PRODUCTION OPTION: 36 credits

PRESCRIBED COURSES (18 credits)

| | | |
|---|---|---|
| AG E 214(3), 322(3), AGRO 028(3), 200(3), AG EC 102(3), ENT 012(3) | — | x |
|---|---|---|

ADDITIONAL COURSE (3 credits)

| | | |
|---------------------------|---|---|
| AG EC 101, 106, or 208(3) | — | x |
|---------------------------|---|---|

SUPPORTING COURSES AND RELATED AREAS (6 credits)

| | | |
|--|---|---|
| Select 3 credits in animal science or poultry science | — | x |
| Select 3 credits in horticulture | | |
| ELECTIVES (9 credits) | — | x |

| | <i>Scheduling Recommendation by Semester Standing</i> | |
|---|---|-----|
| | 1-2 | 3-4 |
| <hr/> GENERAL OPTION: 36 credits | | |
| PRESCRIBED COURSES (6 credits) | | |
| AG EC 297(3), AGRO 200(3) | — | x |
| ADDITIONAL COURSES (15 credits) | | |
| AG EC 101 or 208(3); AG EC 102 or 232(3) | — | x |
| AG EC 106 or 200(3); AGRO 028 or PLTSC 200(3) | — | x |
| MGMT 100 or MKTG 220(3) | — | x |
| SUPPORTING COURSES AND RELATED AREAS (12 credits) | | |
| Select 3 credits in agriculture or business | — | x |
| Select 3 credits in agricultural engineering | — | x |
| Select 6 credits in animal or poultry science | — | x |
| ELECTIVES (3 credits) | | |

ARCHITECTURAL ENGINEERING TECHNOLOGY (2 AET)

JACK KOLESAR, *in charge*

The Architectural Engineering Technology major is designed to provide technically trained personnel between the level of high school graduate and professional architectural engineer or architect to support the architectural design and construction industries. Architectural engineering technicians work under the supervision of a graduate architect or architectural engineer. They translate sketches and design concepts into working drawings and specifications. To do so, they need basic skills in structural and environmental systems design and layout, familiarity with site planning, knowledge of building materials and equipment characteristics and performance, as well as the training in drafting techniques required for the realization of final drawings and specifications. The graduates of this major are prepared for employment in architectural, building engineering, or industrialized housing firms.

Graduates of the Architectural Engineering Technology major may qualify for admission to baccalaureate degree majors in Energy Technology, Mechanical Engineering Technology, or Structural Design and Construction Engineering Technology offered at Penn State Harrisburg, The Capital College. Or they may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering degree in Architectural Engineering Technology, 69-70 credits are required.

| | <i>Scheduling Recommendation by Semester Standing</i> | |
|-------------------------------------|---|-----|
| | 1-2 | 3-4 |
| <hr/> GENERAL EDUCATION: 21 credits | | |

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SPCOM 100(3); MATH 087(5), 088(5); CMPSC 101(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

*Students are placed in ENGL 004 or 015 on the basis of English Placement Test scores. Students who are placed in ENGL 004 also must take ENGL 015 or 826. Students who begin with ENGL 015 are encouraged to take ENGL 202C or 826.

REQUIREMENTS FOR THE MAJOR: 42-43 credits

PRESCRIBED COURSES (39 credits)

| | | |
|---|---|---|
| AE T 801(3), 802(3), 803(3), 813(2), E G 001(2), E MCH 811(3), PHYS 150(3) | x | — |
| AE T 804(3), 806(2), 807(3), 810(3), 814(3), 815(3), PHYS 151(3) | — | x |

ADDITIONAL COURSES (5-6 credits)

Select 5-6 credits from the following technical

| | | |
|---|---|---|
| courses: AE T 812, 830, CHEM 011, CE T 861, CMPSC 102, EE T 800, E G 012, 803, 830, E MCH 813, IE T 805, MATH 140, 141, 231, 250, ME T 807, 881, S T 801, or 830 | — | x |
|---|---|---|

BIOMEDICAL EQUIPMENT TECHNOLOGY (2 BET)

 JACK KOLESAR, *in charge*

During the past several decades, the medical community has grown to depend increasingly on machines for the delivery of quality health care. Biomedical equipment technicians are men and women responsible for maintaining these machines in accurate and safe working order. Their tasks include functional and safety inspecting, preventive maintenance, calibration, troubleshooting, and repair of this equipment. In addition, they may be involved in equipment control programs, in electrical safety assurance programs, and in training hospital personnel in the safe and proper use of the equipment. The classroom and laboratory portions of this major focus on electronically based patient monitoring equipment. The student is, however, exposed to a much broader spectrum of biomedical equipment through a ten-week practical internship in an approved health care facility.

Graduates of the Biomedical Equipment Technology major may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Harrisburg, The Capital College, and at Penn State Erie, The Behrend College.

For the Associate in Engineering degree in Biomedical Equipment Technology, 73 credits are required.

*Scheduling Recommendation
by Semester Standing*

| 1-2 | 3-4 | Summer |
|-----|-----|--------|
|-----|-----|--------|

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SPCOM 100(3); MATH 087(5), 088(5); CMPSC 101(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 48 credits

PRESCRIBED COURSES (45 credits)

| | | | |
|--|---|---|---|
| EE T 801(4), 805(1), 809(1), 810(3), 814(3), 818(2), E G 001(2) | x | — | — |
| BIOL 041(3), CHEM 011(3), PHYS 150(3), 151(3) | x | x | — |
| B E T 801(5), 802(5), 804(3) | — | x | — |
| B E T 803(4) | — | — | x |

*Students are placed in ENGL 004 or 015 on the basis of English Placement Test scores. Students who are placed in ENGL 004 also must take ENGL 015 or 826. Students who begin with ENGL 015 are encouraged to take ENGL 202C or 826.

| | <i>Scheduling Recommendation by Semester Standing</i> | | |
|--|---|-----|--------|
| | 1-2 | 3-4 | Summer |
| ADDITIONAL COURSE (3 credits) Select 3 credits from the following technical courses: B E T 830, BIOL 029, CH ET 831, CE T 861, CMPSC 102, EE T 811, 813, 817, 830, E G 803, E MCH 811, I E 315, MATH 140, 141, 231, or ME T 807 | — | x | — |

BUSINESS ADMINISTRATION (2 B A)

BENJAMIN HENSZEY, *in charge*

The two-year, college-level academic Business Administration major is designed to provide instruction in business administration that fulfills the requirements of various levels of responsibility higher than that held by high school graduates.

The primary objective of this major is to provide a managerially oriented program with sufficient communicative and mathematical skills, socially relevant course work, and advanced courses in specific business specialties to develop a well-rounded graduate.

Graduates of the Business Administration major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Business Administration, Humanities, or Public Policy offered at Penn State Harrisburg, The Capital College. Or they may qualify for one of the following baccalaureate degree majors offered at Penn State Erie, The Behrend College: Accounting, Business Economics, General Business, Management, or Management Information Systems.

For the Associate in Science degree in Business Administration, 65 credits are required.

| | <i>Scheduling Recommendation by Semester Standing</i> | |
|--|---|-----|
| | 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015(3), 202D; SPCOM 100(3); MATH 005(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 44 credits

| | | |
|---|-------------|-------------|
| PRESCRIBED COURSES (21 credits) ACCTG 101(3), 104(3), B LAW 243(3), FIN 100(3), MGMT 100(3), M I S 100(3), MKTG 221(3) | x | x |
| ADDITIONAL COURSES (21 credits) Q B A 101 or 801(3) ECON 002, 004, or 014#(3) Select 15 credits from ACCTG 803, 806, 810, B A 100, 250, 803, B LAW 850, B LOG 301, 304, 305, CMPSC 101, 102, 140, 803, 890, ECON 002+, 004+, FIN 108, 810, H P A 101, 301, 310, INS 102, 810, 820, 830, I B 862, L I R 100, M I S 101, 103, 106, 110, 111, MGMT 802, MKTG 220, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, OPMG 801, PHIL 106, Q B A 102, R EST 100, 810, or 830 | x — — | — x x |
| SUPPORTING COURSES AND RELATED AREAS (2 credits) Select 2 credits in physical education | x | x |

#Students going on to a four-year program should not take ECON 014.
+ Select the course not taken above.

CHEMICAL ENGINEERING TECHNOLOGY (2CHET)

JACK KOLESAR, *in charge*

The Chemical Engineering Technology major prepares students for positions as assistants to chemists, chemical engineers, and petroleum engineers, assistants in research and control laboratories, and trainees for future supervisory positions in manufacturing and production. Graduates of the major have a reasonable proficiency in basic sciences (chemistry, mathematics, and physics), communication skills, and the basic principles of chemical engineering technology.

Graduates of the Chemical Engineering Technology major may qualify for admission to the baccalaureate degree major in Energy Technology offered at Penn State Harrisburg, The Capital College.

For the Associate in Engineering degree in Chemical Engineering Technology, 69-70 credits are required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SPCOM 100(3); MATH 087(5), 088(5); CMPSC 101(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 44-45 credits

PRESCRIBED COURSES (39-40 credits)

| | | |
|---|---|---|
| E G 001(2), PHYS 150(3) | x | — |
| CHEM 012(3-4), 013(3), 014(1), 015(1), 023(4), 034(3), PHYS 151(3) | x | x |
| CH ET 810(4), 811(5), 821(2), 822(2), 830(3) | — | x |

ADDITIONAL COURSES (5 credits)

| | | |
|---|---|---|
| Select 5 credits from the following technical courses: BI SC 003, BIOL 041, 101, CH ET 831, CHEM 035, CMPSC 102, E G 803, 830, E MCH 811, I E 315, IE T 805, MATH 140, 141, 231, 250, METEO 003, or MICRB 106 | — | x |
|---|---|---|

CLINICAL HEALTH SERVICES (2 CHS)

The goal of the Clinical Health Services major is to educate students to assist physicians in providing health care to patients in a primary-care setting.

The major is twenty-one months in length, with two semesters of work in the basic and clinical sciences, one semester (the summer session between the first and second academic year) of activity in the area of categorical clinical experiences, with the final two semesters being spent in a preceptorship in a primary-care environment. Upon completion of the major, the student may take the National Certification Examination for physician assistants.

Admission requirements include 60 undergraduate credits from a regionally approved college or university, or equivalent, including a 3-credit college-level course in each of the following:

*Students are placed in ENGL 004 or 015 on the basis of English Placement Test scores. Students who are placed in ENGL 004 also must take ENGL 015 or 826. Students who begin with ENGL 015 are encouraged to take ENGL 202C or 826.

COMMUNITY SERVICES

English composition, speech communication, humanities, anatomy and physiology, biology, mathematics, microbiology, sociology, and psychology.

For more information, write to The Milton S. Hershey Medical Center, 500 University Drive, Hershey, PA 17033.

For the Associate in Science degree in Clinical Health Services, 72 credits are required. This program is not currently being offered to entering students.

| | <i>Scheduling Recommendation by Semester Standing</i> | | |
|--|---|-----|-----|
| | 1-2 | 3-4 | 5-6 |
| <hr/> GENERAL EDUCATION: 21 credits <hr/> | | | |
| Students are admitted with advanced standing. <hr/> | | | |
| REQUIREMENTS FOR THE MAJOR: 72 credits <hr/> | | | |
| PRESCRIBED COURSES (72 credits) | | | |
| P A 800(7), 801(7), 805(1), 810(3), 820(3), 821(3), 840(2), 841(2), 850(3), 870(1), 871(1) | x | — | — |
| P A 878(9), 880(15) | — | x | — |
| P A 881(15) | — | — | x |

COMMUNITY SERVICES (2ECSV)

JOE MILLER, *in charge*

The Community Services major is designed to provide entry-level professional competency in one of several human service fields. The objective of the major is to provide a general education background, a knowledge base in human development, and a core of professional skills in a particular human services area. Challenges, issues and problems, current approaches and procedures, and elements of program planning and services provision are studied. The major has three options.

The Administration of Justice option is designed to prepare persons for career roles in police departments, probation and parole agencies, and correctional institutions.

The Adult Development and Aging option is designed to prepare persons for a wide variety of service roles in boarding homes, nursing homes, area agencies on aging, senior citizen centers, and other sites which provide services for the elderly.

The Child and Youth Services option is designed to prepare persons for a wide variety of service roles in day and institutional child care agencies, preschools, head start centers, and other child and youth service settings.

The Community Services major includes one semester of field experience in a local community agency.

Graduates of the Community Services major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Humanities, or Public Policy offered at Penn State Harrisburg, The Capital College.

For the Associate in Science degree in Community Services, 62 credits are required.

| | <i>Scheduling Recommendation by Semester Standing</i> | |
|--|---|-----|
| | 1-2 | 3-4 |
| <hr/> GENERAL EDUCATION: 21 credits <hr/> | | |
| <i>Note:</i> Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015(3); ENGL 202A, 202B, 202C, or 202D; SPCOM 100(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education. | | |

*Scheduling Recommendation
by Semester Standing*

| | | |
|--|-----|-----|
| | 1-2 | 3-4 |
|--|-----|-----|

REQUIREMENTS FOR THE MAJOR: 41 credits

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 15 credits

PRESCRIBED COURSES (7 credits)

H DEV 100(1), 101(3), 102(3)

x

—

ADDITIONAL COURSES (8 credits)

ADM J 395* or H DEV 395*(8)

—

x

REQUIREMENTS FOR THE OPTION: 26 credits

ADMINISTRATION OF JUSTICE OPTION: 26 credits
PRESCRIBED COURSES (11 credits)

ADM J 111(3)

x

—

ADM J 221(3), 240(1), 241(2), 394(1), 396(1)

—

x

SUPPORTING COURSES AND RELATED AREAS (15 credits)

Select 15 credits of professional electives in
consultation with adviser

—

x

ADULT DEVELOPMENT AND AGING OPTION: 26 credits
PRESCRIBED COURSES (6 credits)

I F S 129(3), 249(3)

x

—

ADDITIONAL COURSES (9 credits)

Select 9 credits from I F S 218, 219, 229,
239, 311, 315, 327, or NUTR 251

x

x

SUPPORTING COURSES AND RELATED AREAS (11 credits)

Select 11 credits of professional electives in adult
development and aging in consultation with adviser

—

x

CHILD AND YOUTH SERVICES OPTION: 26 credits
PRESCRIBED COURSES (3 credits)

I F S 129(3)

x

—

ADDITIONAL COURSES (12 credits)

Select 3 credits from I F S 229 or 239

x

x

Select 9 credits from I F S 218, 219, 311, 315,
327, 330, or NUTR 251

—

x

SUPPORTING COURSES AND RELATED AREAS (11 credits)

Select 11 credits of professional electives in child
services and child development in consultation
with adviser

—

x

***Guidelines for Field Placement include:**

1. Agencies utilized are local agencies.
2. Priority for placement is made for students with higher semester standings.
3. Prerequisites for placement include for Administration of Justice — ADM J 111, H DEV 102; for Adult Development and Aging — H DEV 101, I F S 249; for Child and Youth Services — H DEV 101; I F S 229 or 239.

COMPUTER SCIENCE (2CPSC)

DEAN FENTON, *in charge*

The primary objective of the two-year Computer Science major is to prepare graduates for immediate and continuing employability as application programmers, associate systems designers, or associate systems programmers.

To meet this objective the major is designed to ensure a thorough knowledge of the techniques of programming general-purpose digital computers, and includes extensive practice—using contemporary programming technologies—in the analysis, organization, validation, and documentation of effective computer code. The major also includes courses offering practical knowledge of the logical organization of modern digital computers and related peripheral equipment, the structure of operating systems and compilers, and considerations in the design of information systems.

The General Education component provides the student with an extension to the basic educational foundation. The General Requirements for the Major give the graduate technical competence in the computing and data processing field. The Application Specialization provides a practical knowledge of an area of application within which the graduate may profitably utilize the acquired computing talent.

Graduates of the Computer Science major may qualify for admission to the baccalaureate degree majors in Business Administration or Mathematical Sciences offered at Penn State Harrisburg, The Capital College. Or they may qualify for admission to one of the following baccalaureate degree majors offered at Penn State Erie, The Behrend College: Accounting, Business Economics, General Business, Management, or Management Information Systems.

For the Associate in Science degree in Computer Science, 64 credits are required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015(3); SPCOM 100(3); MATH 017(3), 018(3); 3 credits selected from Q B A or STAT. Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 43 credits

| | | |
|--|---|---|
| PRESCRIBED COURSES (31 credits) | | |
| CMPSC 100(3), 101(3), 102(3), 140(3), ENGL 202C(3) | x | x |
| CMPSC 142(3), 144(4), 154(3), 164(3), 174(2), 175(1) | — | x |
| SUPPORTING COURSES AND RELATED AREAS (12 credits) | | |
| Technical specialization and related work [see departmental list] (12) | x | x |

DIETETIC FOOD SYSTEMS MANAGEMENT (2EDSM)

SARA PARKS, *in charge*

The purpose of the Dietetic Food Systems Management major is to prepare food systems management dietetic technicians for middle management positions in the food service area of health care facilities or community feeding operations. Candidates for admission to this major must be employed at least fifteen hours a week in a health care facility food service operation where their work is supervised by a registered dietitian. Graduates become eligible for technician membership in the American Dietetic Association.

Students who meet admission criteria are admitted to the extended degree major in Dietetic Food Systems Management. The required courses are available primarily through correspondence study offered by the Department of Independent Learning.

Students who achieve outstanding records may, upon completion of this major, apply for admission to the Management Dietetics option of the baccalaureate degree major in Hotel, Restaurant, and Institutional Management in the College of Health and Human Development. Five additional semesters of satisfactory work are required to earn the baccalaureate degree.

Graduates of this major may also qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Business Administration, Humanities, or Public Policy offered at Penn State Harrisburg, The Capital College.

For the Associate in Science degree in Dietetic Food Systems Management, 67 credits are required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SOC 001 or 003(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 46 credits

PRESCRIBED COURSES (34 credits)

| | | |
|--|---|---|
| D S M 100(1), 103(3), 195(2), 250(4), H P A 101(3) | x | — |
| D S M 260(4), 270(3), 295(4), 304(3), H F S 802(3), NUTR 252(4) | — | x |

ADDITIONAL COURSES (6 credits)

| | | |
|-------------------------------------|---|---|
| D S M 205, MGMT 321, or MGMT 341(3) | x | — |
| NUTR 251 or 801(3) | x | — |

SUPPORTING COURSES AND RELATED AREAS (6 credits)

| | | |
|--|---|---|
| Select 6 credits in consultation with the student's adviser to develop competence as a dietetic practitioner | x | x |
|--|---|---|

ELECTRICAL ENGINEERING TECHNOLOGY (2 EET)

JACK KOLESAR, in charge

The Electrical Engineering Technology major prepares graduates for technological service with manufacturers of electrical, electronic, and computer equipment; electrical utilities; and electrical maintenance and instrumentation departments of various industrial concerns. The principal objective is to provide a practical knowledge of electronic, digital, and microprocessor theory as well as electrical machinery and its application.

Graduates of the Electrical Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology or in Energy Technology offered at Penn State Harrisburg, The Capital College. Or they may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering degree in Electrical Engineering Technology, 71-72 credits are required.

*Students are placed in ENGL 004 or 015 on the basis of English Placement Test scores. Students who are placed in ENGL 004 must also take ENGL 015 or 826.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SPCOM 100(3); MATH 087(5), 088(5); CMPSC 101(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 46-47 credits**PRESCRIBED COURSES (44 credits)**

| | | |
|---|---|---|
| E G 001(2), EE T 801(4), 805(1), 809(1), 810(3), 814(3), 818(2), PHYS 150(3) | x | — |
| EE T 804(2), 806(1), 811(3), 813(3), 815(3), 816(3), 817(4), 819(1), 820(1), 821(1), PHYS 151(3) | — | x |

ADDITIONAL COURSES (2-3 credits)

Select 2-3 credits from the following technical

courses: BI SC 003, CHEM 011, 012, CE T 861, CMPSC 102,

EE T 830, E G 003, 803, 830, E MCH 810, 811, I E 315,

IE T 805, MATH 140, 141, 231, ME T 800, or 807

| | | |
|--|---|---|
| | — | x |
|--|---|---|

FOREST TECHNOLOGY (2FORT)

HARRY MOSHER, *in charge*

The objectives of the Forest Technology major are to train students in the techniques that are basic to planning, organizing, directing, and managing forestry enterprises and to provide a program of general studies that will serve as a foundation for future intellectual growth. It is intended that graduates will act in a supporting capacity to professional foresters.

Graduates of the Forest Technology major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Humanities, or Public Policy offered at Penn State Harrisburg, The Capital College.

For the Associate in Science degree in Forest Technology, 69 credits are required.

*Scheduling Recommendation
by Semester Standing*

| | | |
|-----|--------|-----|
| 1-2 | Summer | 3-4 |
|-----|--------|-----|

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015(3), 202C(3); SPCOM 100(3); MATH 800(3); BIOL 027(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 48 credits**PRESCRIBED COURSES (42 credits)**

| | | | |
|---|---|---|---|
| FOR 137(1), 138(1), 140(2), 141(4), 245(2), 250(3) | x | — | — |
| FOR 105(3), 106(2), 108(1) | x | x | — |
| FOR 234(3), 240(3), 241(4), 242(3) | x | — | x |
| FOR 814(1), 822(1), 860(1) | — | x | x |
| ACCTG 101(3), FOR 220(3), 221(1) | — | — | x |

*Students are placed in ENGL 004 or 015 on the basis of English Placement Test scores. Students who are placed in ENGL 004 also must take ENGL 015 or 826. Students who begin with ENGL 015 are encouraged to take ENGL 202C or 826.

| <i>Scheduling Recommendation by Semester Standing</i> | | |
|---|--------|-----|
| 1-2 | Summer | 3-4 |

ADDITIONAL COURSES (6 credits)

Select 6 credits from FOR 807(3), 817(3), or

WILDL 101(3)

—

x

x

HIGHWAY ENGINEERING TECHNOLOGY (2 HET)JACK KOLESAR, *in charge*

The Highway Engineering Technology major prepares highway construction technicians to perform many of the planning and design tasks necessary in the construction of highways, railroads, bridges, and airports. In the planning stages of construction, a highway construction technician may be engaged in estimating costs, purchasing materials, preparing specifications, computing fills, cuts, and drainage requirements, drafting, designing, or surveying. During actual construction such technicians may perform supervisory functions and inspection.

Graduates of the Highway Engineering Technology major may qualify for admission to the baccalaureate degree major in Structural Design and Construction Engineering Technology offered at Penn State Harrisburg, The Capital College.

For the Associate in Engineering degree in Highway Engineering Technology, 70 credits are required.

| <i>Scheduling Recommendation by Semester Standing</i> | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SPCOM 100(3); MATH 087(5), 088(5); CMPSC 101(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 45 credits**PRESCRIBED COURSES (45 credits)**

CE T 809(2), 811(3), 812(3), 818(2), E G 001(2),

ENGL 826(3), PHYS 150(3)

x

—

CE T 814(3), 821(3), 822(3), 823(3), 824(3), 825(3),

E MCH 811(3), 813(3), PHYS 151(3)

—

x

**HOTEL, RESTAURANT, AND INSTITUTIONAL
MANAGEMENT (2HRIM)**HORACE A. DIVINE, *in charge*

The Hotel, Restaurant, and Institutional Management major is an intensive four-semester major designed to prepare students for managerial positions in the hospitality industry. The course of study places heavy reliance on experience acquired in an on-the-job setting.

Students who achieve outstanding records may, upon completing this program, apply for admission to the baccalaureate degree major in Hotel, Restaurant, and Institutional Management in the College of Health and Human Development. Six or more additional semesters of satisfactory work are required to earn the baccalaureate degree.

*Students are placed in ENGL 004 or 015 on the basis of English Placement Test scores. Students who are placed in ENGL 004 also must take ENGL 015. ENGL 202C or 826 is required for all students in the program.

LABOR STUDIES

Or graduates of this major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Business Administration, Humanities, or Public Policy offered at Penn State Harrisburg, The Capital College.

For the Associate in Science degree in Hotel, Restaurant, and Institutional Management, 66 credits are required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015(3); 3 credits selected from ENGL 202A, 202C, or 202D; SPCOM 100(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 45 credits

PRESCRIBED COURSES (37 credits)

ACCTG 101(3), HR&IM 201(2), 301(3), 310(3), 381(3),

H F S 804(3)

x

—

HR&IM 295(2), 320(3), 337(3), 850(4), 860(4), 870(4)

—

x

SUPPORTING COURSES AND RELATED AREAS (8 credits)

Select 3 credits in nutrition

—

x

Select 5 credits in consultation with adviser to
develop a competency in management or general
business administration

—

x

LABOR STUDIES (2ELBR)

RONALD FILIPPELLI, *in charge*

The purpose of the Labor Studies major is to help employees improve their understanding and competence in coping with personal, group, and organizational problems at their worksites, in relationships with employers, and in transactions with the community, the economy, and the polity. The major consists of a core of labor courses supplemented by introductory liberal arts studies which provide (1) basic communication skills, (2) conceptual tools of analysis, and (3) a more general cultural context for the examination of labor problems.

Graduates of the Labor Studies major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Business Administration, Humanities, or Public Policy offered at Penn State Harrisburg, The Capital College.

For the Associate in Arts degree in Labor Studies, 60 credits are required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 39 credits

PRESCRIBED COURSES (18 credits)

L I R 100(3), 102(3), 103(3), 104(3), 156(3), 296(3)

x

x

*Scheduling Recommendation
by Semester Standing*

1-2

3-4

SUPPORTING COURSES AND RELATED AREAS (21 credits)

Select 21 credits from the following areas in consultation with adviser: economics, history, industrial engineering, journalism, labor and industrial relations, management, political science, psychology, sociology

x

x

LETTERS, ARTS, AND SCIENCES (2 LAS)PAT DUNKLEBARGER, *in charge*

The objectives of the Letters, Arts, and Sciences major are to broaden the student's understanding, interests, and skills; to help the student become a more responsible, productive member of the family and community; and to offer a degree program with sufficient electives to permit some specialization according to the student's interests or career plans. Letters, Arts, and Sciences is a complete two-year degree major. However, graduates who later seek admission to baccalaureate degree majors may apply baccalaureate credits toward the new degree. Any 800-level credits taken in the Letters, Arts, and Sciences program are not applicable toward most baccalaureate degrees.

Graduates of the Letters, Arts, and Sciences major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Elementary Education, Humanities, or Public Policy offered at Penn State Harrisburg, The Capital College. Or they may qualify for any of a large number of baccalaureate degree majors offered by Penn State Erie, The Behrend College, in business, the liberal arts, and sciences.

For the Associate in Arts degree in Letters, Arts, and Sciences, 60 credits are required.

*Scheduling Recommendation
by Semester Standing*

1-2

3-4

GENERAL EDUCATION: 21 credits#

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SPCOM 100(3); 3 credits selected from mathematics (MATH 004 not acceptable), statistics, computer science, or philosophy (PHIL 012 and 212 only); 3 credits selected from any courses designated as physical, biological, or earth sciences; 3 credits selected from any courses designated as arts; 3 credits selected from any courses designated as social and behavioral sciences; ENGL 202A, 202B, 202C, or 202D. Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 39 credits**SUPPORTING COURSES AND RELATED AREAS (24 credits)#**

#The 45 required and related credits must be baccalaureate-level courses. For those intending to seek admission to a baccalaureate program upon graduation, it is recommended that most, if not all, of the courses be at the baccalaureate level. For those students who will seek a Bachelor of Arts degree upon graduation from Letters, Arts, and Sciences, it is strongly recommended that a foreign language be taken since admission to a Bachelor of Arts program in the College of the Liberal Arts requires one college-level course, or the equivalent, in a foreign language.

*Students will be placed in ENGL 004, 015, or 030 on the basis of English Placement Test scores. If a student is placed in ENGL 030, successful completion of that course will satisfy the ENGL 015 requirement. Students must take ENGL 202A, 202B, 202C, or 202D as part of the General Education Selection of the major.

| | | |
|---|----------|----------|
| Select 3 credits in any courses designated as arts + | x | x |
| Select 6 credits in any courses designated as humanities + | x | x |
| Select 3 credits in any courses designated as social and behavioral sciences + | x | x |
| Select 3 credits in any courses designated as physical, biological, or earth sciences + | x | x |
| Select 9 credits in any one of the following areas: + arts, humanities, social and behavioral sciences, natural sciences and quantification, and foreign language skills. (If foreign language courses are chosen, it is recommended that these courses be in one foreign language sequence.) | x | x |
| ELECTIVES (15 credits) | x | x |

MECHANICAL ENGINEERING TECHNOLOGY (2 MET)

JACK KOLESAR, *in charge*

The Mechanical Engineering Technology major is intended to prepare detail or layout drafters and designers for manufacturing industries as well as for the many concerns engaged in installation or erection work. The principal objective is to prepare men and women for employment in machine design, tool and die design, or structural layout. Some graduates are involved in technical or industrial sales, become supervisors in light and heavy industry, or enter management trainee programs.

Graduates of this major may qualify for admission to the baccalaureate degree majors in Mechanical Engineering Technology or Structural Design and Construction Engineering Technology offered at Penn State Harrisburg, The Capital College. Or they may qualify for admission to baccalaureate degree majors in either Mechanical or Plastics Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering degree in Mechanical Engineering Technology, 68-69 credits are required.

| | <i>Scheduling Recommendation by Semester Standing</i> | | |
|--|---|--------|-----|
| | 1-2 | Summer | 3-4 |

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SPCOM 100(3); MATH 087(5), 088(5); CMPSC 101(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 43-44 credits

PREScribed COURSES (38 credits)

| | | | |
|---|---|----|---|
| E G 001(2), 012(2), E MCH 811(3), IE T 811(3), PHYS 150(3) | x | — | — |
| IE T 812(3) | — | x¶ | — |
| AE T 809(3), E G 803(3), E MCH 813(3), 814(1), IE T 815(3), ME T 805(3), 810(3), PHYS 151(3) | — | — | x |

+ Courses that will satisfy the arts, humanities, social and behavioral sciences, natural sciences, and quantification requirements are defined on the Letters, Arts, and Sciences checksheet, which may be obtained from the College of the Liberal Arts associate dean for undergraduate studies at the University Park Campus or from any Letters, Arts, and Sciences representative at the Commonwealth Campuses.

¶To be taken at a regional campus.

*Students are placed in ENGL 004 or 015 on the basis of English Placement Test scores. Students who are placed in ENGL 004 also must take ENGL 015 or 826. Students who begin with ENGL 015 are encouraged to take ENGL 202C or 826.

| <i>Scheduling Recommendation by Semester Standing</i> | | |
|---|--------|-----|
| 1-2 | Summer | 3-4 |

ADDITIONAL COURSES (5-6 credits)

Select 5-6 credits from the following technical

courses: BI SC 003, CHEM 011, 012, CE T 861,
CMPSC 102, EE T 800, E G 003, 830, E MCH 812,
I E 315, IE T 805, MATH 140, 141, 231, 250,
ME T 807, or 830

— — x

MEDICAL LABORATORY TECHNOLOGY (2 MLT)

PHILIP MOHR, *in charge*

The two-calendar-year Medical Laboratory Technology major (four semesters, two summer sessions) is designed to provide the necessary general and technical training for hospital personnel between the level of the medical laboratory technician (certificate program) and the medical technologist (baccalaureate program). The course of study includes one year of intensive clinical experience at an affiliated hospital and the theoretical background necessary for the clinical procedures performed by the certified medical laboratory technician (associate degree program). Upon completion of major requirements, the student receives the associate degree and is eligible to sit for examinations leading to certification and registry as a medical laboratory technician.

The program begins in the summer session.

Graduates of the Medical Laboratory Technology major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Humanities, or Public Policy offered at Penn State Harrisburg, The Capital College.

For the Associate in Science degree in Medical Laboratory Technology, 71-72 credits are required.

| <i>Scheduling Recommendation by Semester Standing</i> | | |
|---|-----|-----|
| Summer | 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015(3); SPCOM 100(3); MATH 004 or 005(3); BIOL 041(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 50-51 credits**PRESCRIBED COURSES (50-51 credits)**

| | | | |
|---|---|---|---|
| MICRB 150(4) | x | — | — |
| CHEM 012(3-4), 014(1), 034(3), BIOL 029(4), 042(1), CMPSC 001(1), MICRB 201(3), 202(2) | — | x | — |
| MICRB 151A(9), 151B(6), 151C(6), 151D(5), 151E(2) | — | — | x |

**METALLURGICAL ENGINEERING TECHNOLOGY
(2METE)**

DONALD A. KOSS, *in charge*

The Metallurgical Engineering Technology major prepares students for positions in the metallurgical and metals-oriented industries as technical personnel in research laboratories and in quality control, and as supervisors of service groups and of production operations.

MICROCOMPUTER ENGINEERING TECHNOLOGY

Graduates of the Metallurgical Engineering Technology major may qualify for admission to the baccalaureate degree major in Energy Technology offered at Penn State Harrisburg, The Capital College.

For the Associate in Engineering degree in Metallurgical Engineering Technology, 72 credits are required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 004(3) or 015(3); SPCOM 100(3); MATH 087(5); CHEM 011(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 49 credits

PRESCRIBED COURSES (43 credits)

| | | |
|---|---|---|
| CHEM 012(3), 014(1), E G 001(2), MATH 808(4), MET E 800(4), PHYS 150(3), 151(3) | x | — |
| CMPSC 101(3), EE T 800(2), IE T 809(3), MET E 801(2), 802(3), 803(3), 804(3), 805(3), 807(1) | — | x |

ADDITIONAL COURSES (6 credits)

| | | |
|--------------------------|---|---|
| ENGL 202A or 826(3) | x | — |
| IE T 812 or MET E 806(3) | x | — |

MICROCOMPUTER ENGINEERING TECHNOLOGY (2MCMP)

JACK KOLESAR, *in charge*

The Microcomputer Engineering Technology major prepares graduates for technical positions in the rapidly expanding field of microcomputers and their applications. A broad background in electrical and electronic principles is used as a foundation upon which to build the basic concepts of the microprocessor, to examine its internal functions, and to investigate its applications. Exposure to a variety of microprocessor/microcomputer systems and devices used with computers as well as hands-on experience in the operation, analysis, and construction of small computer systems provides graduates with a sound foundation for installing, diagnosing, and servicing microprocessor/microcomputer systems and the devices used with them.

Graduates of the Microcomputer Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology or in Energy Technology offered at Penn State Harrisburg, The Capital College. Or they may qualify for the baccalaureate Electrical Engineering Technology major offered at Penn State Erie, The Behrend College.

For the Associate in Engineering degree in Microcomputer Engineering Technology, 72-73 credits are required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SPCOM 100(3); MATH 087(5), 088(5); CMPSC 101(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

*Students are placed in ENGL 004 or 015 on the basis of English Placement Test scores. Students who are placed in ENGL 004 also must take ENGL 015 or 826. Students who begin with ENGL 015 are encouraged to take ENGL 202C or 826.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

REQUIREMENTS FOR THE MAJOR: 47-48 credits

PRESCRIBED COURSES (42 credits)

| | | |
|---|---|---|
| E G 001(2), PHYS 150(3), EE T 801(4), 805(1), 809(1), 810(3), 814(3), 818(2) | x | — |
| EE T 811(3), 817(4), 820(1), PHYS 151(3), MCMP 840(5), 841(4), 842(3) | — | x |

ADDITIONAL COURSES (5-6 credits)

Select 2-3 credits from the following technical

courses: BI SC 003, CHEM 011, 012, CE T 861, CMPSC 102,

EE T 830, E G 003, 803, 830, E MCH 813, IE T 315, 805,

MATH 140, 141, 231, ME T 800, 807

| | | |
|--|---|---|
| | — | x |
|--|---|---|

Select 3 credits in computer science

| | | |
|--|---|---|
| | — | x |
|--|---|---|

MINING TECHNOLOGY (2MNGT)

JAN MUTMANSKI, *in charge*

A student in the Mining Technology major covers a blend of basic sciences, mathematics, communications, humanities and social sciences, and applied courses during the period of study. These courses are sequenced so that basic principles of physical processes are used to understand the specific procedures involved in mining. The curriculum covers a breadth of material at a level consistent with potential careers of mining technology graduates.

This major prepares students for either a management-oriented or an engineering-oriented position in the mining industry. Many graduates of this major, after serving the required apprenticeship, become certified managers in their fields.

The Maintenance option prepares a student to become a maintenance supervisor. Initially, the graduate may work as an apprentice electrician or mechanic to gain experience in repairs and planned maintenance. After certification is obtained, the graduate may become involved with maintenance planning, working as or with the chief mine mechanic or chief mine electrician.

The Production option prepares a student to become a mine foreman or an engineering aide. Initially, some of the duties are to run transit and act as survey party chief, keep mine maps up-to-date and make projections, take samples and run analyses, make time studies, and assist with materials handling layouts.

The Surface Mining option prepares a student for work as an engineering aide or as a supervisor in surface mining. At first, the graduate works as an assistant to engineers or to other supervisors. After a period of training, the graduate may become involved in such areas of mining as pit design, equipment utilization, environmental control, reclamation, and mine laws and regulations.

Graduates of the Mining Technology major may qualify for admission to the baccalaureate degree majors in Energy Technology or in Structural Design and Construction Engineering Technology offered at Penn State Harrisburg, The Capital College.

For the Associate in Engineering degree in Mining Technology, 72 credits are required.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015(3); SPCOM 100(3); MATH 087(5); CHEM 011(3); ECON 014(3); GEOSC 001 or 020(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 49 credits

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 25 credits

PRESCRIBED COURSES (25 credits)

| | | |
|---|---|---|
| CMPSC 101(3), E G 001(2), E MCH 811(3), MATH 808(4), PHYS 150(3) | x | — |
| MNG T 800(1), 804(3), 806(3) | x | x |
| ENGL 826(3) | — | x |

REQUIREMENTS FOR THE OPTION: 24 credits

MAINTENANCE OPTION: 24 credits

PRESCRIBED COURSES (24 credits)

| | | |
|--|---|---|
| MGMT 100(3), MNG T 801(3), 802(3), 807(3), 808(3), 809(3), 810(3), 811(3) | — | x |
|--|---|---|

PRODUCTION OPTION: 24 credits

PRESCRIBED COURSES (21 credits)

| | | |
|---|---|---|
| MN PR 061(3), MNG 023(3), 030(3), MNG T 801(3), 802(3), 803(3), 805(3) | — | x |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (3 credits)

| | | |
|---------------------------------------|---|---|
| Select 3 credits in mining technology | — | x |
|---------------------------------------|---|---|

SURFACE MINING OPTION: 24 credits

PRESCRIBED COURSES (21 credits)

| | | |
|---|---|---|
| MN PR 061(3), MNG 023(3), MNG T 815(3), 816(3), 817(3), 818(3), 819(3) | — | x |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (3 credits)

| | | |
|---------------------------------------|---|---|
| Select 3 credits in mining technology | — | x |
|---------------------------------------|---|---|

NUCLEAR ENGINEERING TECHNOLOGY (2 NET)

JACK KOLESAR, *in charge*

The Nuclear Engineering Technology major is designed to provide technically trained personnel to support the rapidly developing nuclear industry. The wide scope of training prepares the nuclear technician for careers in radiation safety, reactor operations, radioisotope handling, nuclear and control instrumentation, fuel fabrication, and health physics. A nuclear technician may work as a radiological safety specialist, engineering aide, or enter training as a reactor operator at a nuclear facility.

Graduates of the Nuclear Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology or in Energy Technology offered at Penn State Harrisburg, The Capital College. Or they may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering degree in Nuclear Engineering Technology, 71 credits are required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SPCOM 100(3); MATH 087(5), 088(5); CMPSC 101(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 46 credits

PRESCRIBED COURSES (46 credits)

| | | |
|---|---|----|
| ENGL 826(3), EE T 801(4), 809(1), 814(3), E G 001(2) | — | x |
| CHEM 011(3), PHYS 150(3), 151(3) | x | x |
| ME T 807(3), NE T 801(2), 802(4), 805(3) | — | x |
| NE T 803(3), 804(3), 812(3), 814(3) | — | x¶ |

*Students are placed in ENGL 004 or 015 on the basis of English Placement Test scores. Students who are placed in ENGL 004 also must take ENGL 015. ENGL 202C or 826 is required for all students in the program.

¶To be taken at University Park Campus.

PHYSICAL THERAPIST ASSISTANCE (2 PTA)

RICHARD ST. PIERRE, *in charge*

The Physical Therapist Assistance major is designed to provide an opportunity for interested students to develop knowledge and skills in the principles of physical therapy techniques, appropriate use of equipment associated with various physical therapy treatment modalities, and the basic diagnostic approaches necessary for adequate rehabilitation programming efforts. In order to accomplish these tasks, the major utilizes a combination of basic science and nonscience course work coupled with appropriate clinical experiences.

To enter this major, students must have a high school diploma and satisfactory Scholastic Aptitude Test scores. The size of each entering class must be limited to ten students so that optimal clinical experiences and practical application situations can be maintained. Close, personal supervision is essential for total program integrity.

For the Associate in Science degree in Physical Therapist Assistance, 67 credits are required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4 5

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 004 or 015(3); ENGL 015, 202A, or 202C(3); SPCOM 100A(3); MATH 005 or 017(3); BI SC 001, 002, or 003(3); SOC 001(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

| | <i>Scheduling Recommendation by Semester Standing</i> | | |
|---|---|-----|---|
| | 1-2 | 3-4 | 5 |
| REQUIREMENTS FOR THE MAJOR: 46 credits | | | |
| PRESCRIBED COURSES (45 credits) | | | |
| BIOL 029(4), HL ED 800¶(3), 807(1), PH SC 007(3), PSY 002(3) | x | — | — |
| BIOL 041(3), 042(1), HL ED 384(3), 801(4), 803(3), 804(3) | — | x | — |
| HL ED 802(1), 805(2), 806¶(10), 808(1) | — | — | x |
| SUPPORTING COURSES AND RELATED AREAS (1 credit) | | | |
| Select 1 credit in HL ED or PH ED | x | — | — |

¶Courses that include clinical education experiences may require the student to travel long distances or obtain housing near the assigned clinic. Housing and transportation arrangements are the responsibility of the student.

RAILWAY ENGINEERING TECHNOLOGY (2 RET)

JACK KOLESAR, *in charge*

The objective of the Railway Engineering Technology major is to prepare railway technicians for the revitalized railway industry. Such individuals will be able to run surveys, solve right-of-way and drainage problems, deal with track layout and maintenance problems, and work with basic railway structures. Graduates of the Railway Engineering Technology major may find employment as track foremen, track supervisors, track inspectors, or management trainees with the American railroads; as track inspectors with the Federal Railroad Administration; or as designers and estimators with consulting engineers.

Graduates of the Railway Engineering Technology major may qualify for admission to the baccalaureate degree major in Structural Design and Construction Engineering Technology offered at Penn State Harrisburg, The Capital College.

For the Associate in Engineering degree in Railway Engineering Technology, 69-70 credits are required.

| | <i>Scheduling Recommendation by Semester Standing</i> | | |
|--|---|--------|-----|
| | 1-2 | Summer | 3-4 |
| GENERAL EDUCATION: 21 credits | | | |
| <i>Note:</i> Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SPCOM 100(3); MATH 087(5), 088(5); CMPSC 101(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education. | | | |
| REQUIREMENTS FOR THE MAJOR: 44-45 credits | | | |
| PRESCRIBED COURSES (42 credits) | | | |
| CE T 809(2), 811(3), 812(3), 818(2), E G 001(2), PHYS 150(3), 151(3) | x | — | x |
| CE T 813(4) | — | x | — |
| CE T 840(3), 841(3), 842(3), 843(3), EE T 800(2), E MCH 811(3), 813(3) | — | — | x |

*Students are placed in ENGL 004 or 015 on the basis of English Placement Test scores. Students who are placed in ENGL 004 also must take ENGL 015 or 826. Students who begin with ENGL 015 are encouraged to take ENGL 202C or 826.

*Scheduling Recommendation
by Semester Standing*

| | | |
|-----|--------|-----|
| 1-2 | Summer | 3-4 |
|-----|--------|-----|

ADDITIONAL COURSES (2-3 credits)

Select 2-3 credits from the following technical courses: CE T 822, 823, 824, 825, 830, 861, CHEM 011, 012, CMPSC 102, EE T 800, E G 803, 830, I E 315, 805, MATH 140, 141, 231, ME T 800, or 807

— — x

SCIENCE (2 SC)

GARY MULLEN, *in charge*

The Science major is primarily designed to provide for the basic educational needs of students who want to pursue professional programs in various medically related fields. The major provides a group of basic science courses that are valuable to those students seeking positions in government or industry where such knowledge is necessary or desirable.

The Radiologic Technologist Radiographer option requires seven semesters (five semesters and two summer sessions) of formal classroom and clinical education. In the clinical practicum, the student is required to demonstrate competency in performing examinations under supervision in the radiology department of a participating hospital. This generally requires between 1800 and 2400 clock hours. In addition to receiving the Associate in Science degree, the student who successfully completes the major is eligible to take the American Registry of Radiologic Technologists (ARRT) examination for certification.

Graduates of the General option of the Science major may qualify for admission to the baccalaureate degree major in Mathematical Sciences offered at Penn State Harrisburg, The Capital College.

For the Associate in Science degree in Science, 66 credits are required.

*Scheduling Recommendation
by Semester Standing*

| | | | |
|-----|-----|-----|---|
| 1-2 | 3-4 | 5-6 | 7 |
|-----|-----|-----|---|

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015(3); SPCOM 100(3); CHEM 011(3); 3 credits selected from mathematics (MATH 005 recommended for Radiologic Technologist Radiographer option; MATH 007 recommended for General option). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 45-53 credits**COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 17 credits****PRESCRIBED COURSES (17 credits)**

| | | | | |
|----------------------------------|---|---|---|---|
| BIOL 029(4), 101(4), PHYS 150(3) | x | — | — | — |
| BIOL 041(3), PHYS 151(3) | — | x | — | — |

| | <i>Scheduling Recommendation by Semester Standing</i> | | | |
|---|---|-----|-----|---|
| | 1-2 | 3-4 | 5-6 | 7 |
| REQUIREMENTS FOR THE OPTION: 28-36 credits | | | | |
| GENERAL OPTION: 28 credits | | | | |
| PRESCRIBED COURSES (10 credits) | | | | |
| MATH 110(4) | x | — | — | — |
| CMPSC 101(3), MICRB 106(2), 107(1) | — | x | — | — |
| ADDITIONAL COURSES (15 credits) | | | | |
| CHEM 034 or BIOCH 001(3) | — | x | — | — |
| Select 12 credits from the following biological, mathematical, and physical science courses: | | | | |
| ASTRO 001(3), BIOL 033(3), 042(1), 102(4), BI SC 003(3), CHEM 035(3), 102(3), MATH 111(2), PHIL 212(3), PHYS 297(3), or STAT 200(4) | x | x | — | — |
| SUPPORTING COURSES AND RELATED AREAS (3 credits) | | | | |
| Select 3 credits from arts and humanities | x | x | — | — |
| RADIOLOGIC TECHNOLOGIST RADIOGRAPHER OPTION: 36 credits | | | | |
| PRESCRIBED COURSES (36 credits) | | | | |
| BIOL 033(3), CMPSC 100(3), HUMAN 101(3), MATH 006(3), PHYS 297(3), R T R 101(3), 102(3) | x | — | — | — |
| R T R 103(3), 104(3) | — | x | — | — |
| R T R 105(3), 106(3) | — | — | x | — |
| R T R 107(3) | — | — | — | x |

SOCIOLOGY (2ESOC)

RICHARD BORD, *in charge*

The Sociology major introduces students to the study of human groups and their relationships to each other and to the environment. It enables students to gain some proficiency in the scientific study of group structures and processes. A further objective is to help students become more skillful in working with community institutions, agencies, and organizations either through gainful employment or as a volunteer.

Graduates of the Sociology major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Humanities, or Public Policy offered at Penn State Harrisburg, The Capital College.

For the Associate in Arts degree in Sociology, 60 credits are required.

| | <i>Scheduling Recommendation by Semester Standing</i> | |
|--|---|-----|
| | 1-2 | 3-4 |
| GENERAL EDUCATION: 21 credits | | |
| <i>Note:</i> Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015(3); SPCOM 100(3); social sciences (3) not to include sociology. Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education. | | |
| REQUIREMENTS FOR THE MAJOR: 39 credits | | |
| PRESCRIBED COURSES (6 credits) | | |
| SOC 001(3) | x | — |
| SOC 007(3) | — | x |

| | <i>Scheduling Recommendation by Semester Standing</i> | |
|---|---|-----|
| | 1-2 | 3-4 |
| ADDITIONAL COURSES (12 credits) | | |
| Select 12 credits from SOC 003, 005, 012, 013, 015, 023, 030, 047, or 055 | x | x |
| SUPPORTING COURSES AND RELATED AREAS (12 credits) | | |
| Select 12 credits in arts, humanities, social and behavioral sciences | x | x |
| ELECTIVES (9 credits) | x | x |

SOLAR AND THERMAL TECHNOLOGY (2SOLR)

JACK KOLESAR, *in charge*

The Solar and Thermal Technology major prepares engineering technicians for the expanding thermal, solar, and related industries. Students will be able to help design, specify, test, and supervise installation and to make cost estimates for residential and commercial heating and cooling systems using recognized standard components, with special emphasis on solar applications.

Graduates from the Solar and Thermal Technology major may qualify for admission to the baccalaureate degree majors in Energy Technology or in Structural Design and Construction Engineering Technology offered at Penn State Harrisburg, The Capital College. Or they may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering degree in Solar and Thermal Technology, 69 credits are required.

| | <i>Scheduling Recommendation by Semester Standing</i> | |
|--|---|-----|
| | 1-2 | 3-4 |
| GENERAL EDUCATION: 21 credits | | |
| <i>Note:</i> Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SPCOM 100(3); MATH 087(5), 088(5); CMPSC 101(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education. | | |
| REQUIREMENTS FOR THE MAJOR: 44 credits | | |
| PRESCRIBED COURSES (38 credits) | | |
| AE T 801(2), 802(2), EE T 800(2), E G 001(2), ME T 881(4), PHYS 150(3), S T 801(2) | x | — |
| AE T 803(3), 804(3), PHYS 151(3), S T 804(3), 807(3), 808(3), 809(3) | — | x |
| ADDITIONAL COURSES (6 credits) | | |
| Select 6 credits from the following technical courses: AE T 807, 809, 810, 814, 815, 830, CMPSC 102, CHEM 011, 012, E G 803, 830, E MCH 811, 812, 813, MATH 140, 141, 231, 250, S T 806, or 830 | — | x |

*Students are placed in ENGL 004 or 015 on the basis of English Placement Test scores. Students who are placed in ENGL 004 also must take ENGL 015 or 826. Students who begin with ENGL 015 are encouraged to take ENGL 202C or 826.

SURVEYING TECHNOLOGY (2 SRT)

JACK KOLESAR, *in charge*

The objectives of the Surveying Technology major are to provide a knowledge of the elements of surveying as applied to construction, land, topographic, geodetic, city, and photogrammetric surveys, and to develop trained personnel who understand the relation between the precision of measurements and the interpretation of data in addition to having an appreciation of the skills and equipment needed to make precise measurements in the field of surveying.

Graduates of the Surveying Technology major may qualify for admission to the baccalaureate degree major in Structural Design and Construction Engineering Technology offered at Penn State Harrisburg, The Capital College.

For the Associate in Engineering degree in Surveying Technology, 70-71 credits are required.

| Scheduling Recommendation by Semester Standing | | |
|---|--------|-----|
| 1-2 | Summer | 3-4 |

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SPCOM 100(3); MATH 087(5), 088(5); CMPSC 101(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 45-46 credits

PRESCRIBED COURSES (43 credits)

| | | | |
|--|---|---|---|
| CE T 809(2), 811(3), 812(3), 818(2), E G 001(2), ENGL 826(3) | x | — | — |
| PHYS 150(3), 151(3) | x | — | x |
| CE T 813(4) | — | x | — |
| CE T 810(3), 814(3), 815(3), 816(3), 817(2), 890(2), E G 012(2) | — | — | x |

ADDITIONAL COURSES (2-3 credits)

| | | | |
|---|---|---|---|
| Select 2-3 credits from the following technical courses: CE T 822, 823, 824, 825, 830, 840, 841, 861, CHEM 011, 012, CMPSC 102, EE T 800, E G 003, 803, 830, E MCH 810, 811, I E 315, IE T 805, MATH 140, 141, 231, or ME T 800 | — | — | x |
|---|---|---|---|

*Students are placed in ENGL 004 or 015 on the basis of English Placement Test scores. Students who are placed in ENGL 004 must take ENGL 015. ENGL 202C or 826 is required for all students in the program.

TELECOMMUNICATIONS TECHNOLOGY (2TELT)

JACK KOLESAR, *in charge*

The field of telecommunications includes the transmission of voice and digital signals by telephone, telegraph, radio, television, and satellite. Graduates of the Telecommunications major will be engineering technicians who help select, design, install, operate, maintain, troubleshoot, and repair modern telecommunications systems. Future uses for telecommunications systems include electronic mail, electronic shopping, home computer terminal tie-ins, remote utility meter reading, and the transmission of biomedical data between hospitals, libraries, and doctors' offices.

Graduates of the Telecommunications Technology major may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Harrisburg, The Capital College, or Penn State Erie, The Behrend College.

For the Associate in Engineering degree in Telecommunications Technology, 71 credits are required.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015*(3); SPCOM 100(3); MATH 087(5); 088(5); CMPSC 101(3). Students admitted after spring semester 1988 should consult with their adviser about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 46 credits**PRESCRIBED COURSES (46 credits)**

| | | |
|---|---|---|
| EE T 801(4), 805(1), 809(1), 810(3), 814(3), 818(2), E G 001(2), PHYS 150(3) | x | — |
| EE T 811(3), 816(3), 817(4), 820(1), 821(1), IE T 805(2), PHYS 151(3), TELCM 840(2), 841(3), 842(1), 843(3), 844(1) | — | x |

*Students are placed in ENGL 004 or 015 on the basis of English Placement Test scores. Students who are placed in ENGL 004 also must take ENGL 015 or 826. Students who begin with ENGL 015 are encouraged to take ENGL 202C or 826.

WILDLIFE TECHNOLOGY (2WLT)

MICHAEL LACKI, *in charge*

The Wildlife Technology major prepares students in the techniques of wildlife management. Personnel trained in this field are needed to assist in the applied phases of natural resource management, wildlife biology, range management, and the care, maintenance, and propagation of animals. Graduates should be able to support professionals in wildlife biology, park managers, game refuge managers, and laboratory technicians in research.

For the Associate in Science degree in Wildlife Technology, 65 credits are required.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

GENERAL EDUCATION: 21 credits

Note: Students admitted prior to summer session 1988 were required to take the following courses to fulfill a portion of their General Degree Requirements: ENGL 015(3), 202C(3); SPCOM 100(3); MATH 087(3). Students admitted after spring semester 1988 should consult with their advisers about selecting courses approved for General Education.

REQUIREMENTS FOR THE MAJOR: 44 credits**PRESCRIBED COURSES (44 credits)**

| | | |
|--|---|---|
| CE T 809(2), FOR 240(3), 250(3), WILDL 101(3), 103(3), 802(2), 806(2) | x | — |
| AG 113(1), FOR 242(3), HL ED 013(1), WILDL 204(4), 207(3), 208(3), 209(4), 211(4), 213(3) | — | x |

COURSE DESCRIPTIONS

CREDITS AND HOURS

Credits are awarded on the semester-hour basis. According to Senate Policy 42-23, a total of at least forty hours of work planned and arranged by the University faculty is required for the average student to gain 1 credit. While the distribution of time varies from course to course, generally, one-third of the time is devoted to formal instruction, such as lecture, recitation, laboratory, field trips, etc., and two-thirds of the time to outside preparation.

Credits, classroom work, and practicum or laboratory work are indicated by three numbers in parentheses immediately following the course title—for example (3:3:0):

1. The first number shows the maximum credits authorized for the course.
2. The second number shows the periods of classroom work (including lecture, recitation, class discussion, demonstration, or various combinations of these).
3. The third number shows the periods of practicum work (including laboratory, shop work, studio, drafting room, field trips, etc.).

A typical period is fifty minutes.

Courses numbered from 800 to 899 are reserved for the associate degree majors. Credit received for 800-series courses may be applicable to a particular baccalaureate degree program offered by the University at the discretion of the appropriate college and major department. Courses numbered from 1 to 399 carry baccalaureate credit and are required in most of the associate degree majors. Elective credit courses vary from campus to campus and semester to semester, and all of the courses listed below are not offered at each campus. Students can obtain information about the specific course offerings for a given campus from the appropriate *Schedule of Classes*.

GENERAL EDUCATION SUFFIXES

The following suffixes are used in the course description section to designate courses that have been approved for General Education:

Skills Courses

Writing/Speaking—GWS
Quantification—GQ
Health Sciences—GHS
Physical Education—GPE

Breadth Courses

Natural Sciences—GN
Arts—GA
Humanities—GH
Social and Behavioral Sciences—GS

Depth Courses

Natural Sciences—DN
Arts—DA
Humanities—DH
Social and Behavioral Sciences—DS

ACCOUNTING (ACCTG)

016. INTRODUCTORY ACCOUNTING SURVEY (3:3:0) Accounting for proprietorships, partnerships, and corporations for retailers and manufacturers; financial statement analysis. Students who have passed ACCTG 101 may not schedule this course.

101. INTRODUCTORY FINANCIAL ACCOUNTING (3:2½:1) Fundamentals of the collection, recording, summarization, and interpretation of accounting data.
104. INTRODUCTORY MANAGERIAL ACCOUNTING (3:2½:1) Actual and standard cost systems; managerial uses of cost data. Prerequisite: ACCTG 101.
801. INTRODUCTORY ACCOUNTING (3:2:1)
802. INTRODUCTORY ACCOUNTING (3:2:1) Prerequisite: ACCTG 801.
803. INTERMEDIATE ACCOUNTING (3:3:0) Financial accounting statements, concepts, and procedures; assets, liabilities, owners' equity, statement analysis. Prerequisite: ACCTG 802.
806. FEDERAL TAX ACCOUNTING (3:3:0) Federal tax revenue system as it affects the individual and business; tax planning, research, and preparation of returns. Prerequisite: ACCTG 802.
807. MANAGERIAL ACCOUNTING (3:3:0) Cost and budgetary control; preparation of information for decision making. Prerequisite: ACCTG 802.
810. INTRODUCTION TO FEDERAL TAX PREPARATION (1:1:0) Preparation of tax returns for low-income and elderly individuals in cooperation with the IRS Volunteer Income Tax Assistance Program. Prerequisite: ACCTG 101 or 802.
816. INTRODUCTORY ACCOUNTING SURVEY (3:3:0) Fundamentals of accumulation and summarization of accounting data; emphasis on financial statement analysis and the uses of accounting in business.

ADMINISTRATION OF JUSTICE (ADM J)

111. INTRODUCTION TO THE AMERICAN CRIMINAL JUSTICE SYSTEM (3:3:0) Criminal justice systems, including formulation of laws, extent of crime, processing and correction of offenders, victims.
221. ISSUES IN THE AMERICAN CRIMINAL JUSTICE SYSTEM (3:3:0) Examination of the models of the criminal process, functions of the justice system, and approaches to crime and punishment. Prerequisite: ADM J 111.
240. FIELD RESEARCH IN THE ADMINISTRATION OF JUSTICE (1:1:0) Field research strategies appropriate to the investigation of research questions in the administration of justice. Prerequisite: ADM J 111.
394. INTRODUCTION TO FIELD WORK IN ADMINISTRATION OF JUSTICE (1:1:0) Planning and preparation for field experience in an administration of justice agency setting. Prerequisites: ADM J 221, 240.
395. FIELD WORK IN ADMINISTRATION OF JUSTICE (13:0:26) Field experience focusing on the student's major interest within the administration of justice. Prerequisite: ADM J 394.
396. POST FIELD WORK SEMINAR IN ADMINISTRATION OF JUSTICE (1:1:0) Examination of concepts, critical issues, processes, and procedures which are useful in explaining and understanding the field internship experience. Prerequisite: ADM J 395.

AGRICULTURAL ECONOMICS (AG EC)

101. (DS) INTRODUCTION TO AGRICULTURAL ECONOMICS (3:3:0) Application of economic principles to resource allocation problems in the production, marketing, and consumption of food and agricultural products. Not open to students in the Agricultural Economics and Rural Sociology or Agricultural Business Management major or students who have completed ECON 302.
102. INTRODUCTION TO FOOD AND AGRICULTURAL MARKETING (3:3:0) Comprehensive theoretical and descriptive survey of farm and food products marketing from the perspective of producers, marketing middlemen, and consumers.
106. INTRODUCTION TO FARM MANAGEMENT (3:3:0) Organizing and operating farm businesses for financial success; measuring profits; improving efficiency of labor, land, capital; getting started in farming.

AMERICAN STUDIES (AM ST)

100. (GH) INTRODUCTION TO AMERICAN STUDIES (3:3:0) A study of selected attempts to identify and interpret movements and patterns in American culture. Prerequisite: third-semester standing.
105. (DH) AMERICAN POPULAR CULTURE AND FOLKLIFE (3:3:0) Survey of popular culture, folklife, and ethnicity, synthesizing material from such areas as literature, media, entertainment, print, music, and film.
196. (ENGL 196) INTRODUCTION TO AMERICAN FOLKLORE (3:3:0) A basic introduction to verbal and nonverbal folklore stressing the basic procedures of collection, classification, and analysis.
197. (ENGL 197) AMERICAN FOLK SONG IN ENGLISH (3:3:0) British songs in America; native repertoires, white and black; folk ballad; and musical development.

ANTHROPOLOGY (ANTH)

001. (GS) INTRODUCTORY ANTHROPOLOGY (3:3:0) Prehistoric and traditional peoples and cultures; traditional customs and institutions compared with those of modern society.
045. (GS) CULTURAL ANTHROPOLOGY (3:3:0) Beginnings of human culture; economic life, society, government, religion, and art among traditional peoples.

ARCHITECTURAL ENGINEERING TECHNOLOGY (AE T)

801. BUILDING MATERIALS (3:3:0) Structural and architectural use of building materials and construction assemblies.
802. METHODS OF CONSTRUCTION (3:1:5) Materials and methods of construction used in buildings, as expressed in drawings. Prerequisite or concurrent: AE T 801, E G 001.
803. PLUMBING AND FIRE PROTECTION (3:2:2) Layout of plumbing and fire protection in buildings to meet code and usage requirements. Prerequisite or concurrent: AE T 802.
804. HEATING, VENTILATING, AND AIR CONDITIONING LAYOUT (3:2:2) Fundamental calculations and layout of systems in buildings. Prerequisite: AE T 803. Or concurrent: AE T 802.
806. ARCHITECTURAL PRESENTATION (2:1:2) Visual communication through architectural presentation drawings. Line, value, color, and composition. Prerequisite: E G 001 or 003.
807. ADVANCED CONSTRUCTION METHODS (3:1:5) Integration of materials and systems in working drawings. Prerequisite: fourth-semester standing.
809. STRUCTURE DESIGN (3:2:3) Elementary principles of structural design and detailing in timber, steel, and reinforced concrete; use of handbooks; fundamentals of structural and architectural drafting. Prerequisites: E MCH 813; AE T 802 or E G 803.
810. ARCHITECTURAL ENGINEERING OFFICE PRACTICE (3:3:0) Procedures involved in production of contract documents, both drawings and specifications. Prerequisite: fourth-semester standing.
812. BUILDING LIGHTING AND ELECTRICAL LAYOUT (3:2:2) Layout of lighting and electrical distribution in buildings.
813. SITE PLANNING (2:1:2) Energy conservation through optimum site utilization, contours, cut and fill calculations, storm drainage, spot grading, and finish grading.
814. STEEL CONSTRUCTION (3:2:2) Strength of materials as applied to the design of simple steel structures. Prerequisites: AE T 802, E MCH 811.
815. CONCRETE CONSTRUCTION (3:2:2) Fundamentals of design and construction of reinforced concrete structures. Prerequisites: AE T 802, E MCH 811.
830. SELECTED TOPICS IN ARCHITECTURAL ENGINEERING TECHNOLOGY (3) Individual or group work in architectural engineering technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.

ART (ART)

- 110. (DA) DESIGN: TWO DIMENSIONAL (3:2:4) Introduction to design in two dimensions. Pictorial space and the principles of visual organization of the flat surface.
- 111. (DA) DESIGN: THREE DIMENSIONAL (3:2:4) Introduction to design in three dimensions. Principles of visual organization in working with actual space and volume.
- 120. (DA) INTRODUCTION TO DRAWING (3:2:4) The study and practice of basic drawing as a way of understanding and communicating.
- 121. DRAWING: TECHNIQUES, MATERIALS, AND TOOLS (3:2:4) Drawing with an emphasis on organization and the development of drawing skills through a variety of techniques, materials, and tools. Prerequisite: ART 120.
- 180. (DA) CERAMIC ARTS (3:2:4) Introduction to potter's wheel techniques; experiments with decorative application; includes the technical concerns for clay, glazes, and kilns. For non-Art majors.
- 280. INTRODUCTORY CERAMIC ARTS (3:2:4) The fundamentals of ceramics, throwing, hand-building, and glazing; acquainting the student with ceramic materials, techniques, and philosophy. Prerequisite: 2 credits in studio art.
- 296. INDEPENDENT STUDIES (1-18)

ART EDUCATION (A ED)

- 014. INTRODUCTORY CRAFTS FOR TEACHERS (3:1:5) Direct experience with materials such as wood, clay, metal, paper, textiles, and plastics in relationship to the creative needs of children.

ART HISTORY (ART H)

- 100. (GA) INTRODUCTION TO ART (3:3:0) An approach to the understanding of art through a critical analysis of selected works of architecture, painting, and sculpture. Students who have passed ART H 110 may not schedule this course.
- 110. SURVEY OF WESTERN ART (3:3:0) General survey of major developments in architecture, painting, and sculpture in the Western world. Students who have passed ART H 100 may not schedule this course.
- 111. (GA) SURVEY OF WESTERN ART I (3:3:0) Survey of the major monuments and trends in the history of art from prehistory through the late Gothic period. Students who have passed ART H 110 may not schedule this course.
- 112. (GA) SURVEY OF WESTERN ART II (3:3:0) Survey of the major monuments and trends in the history of art from the Renaissance to the modern era. Students who have passed ART H 110 may not schedule this course.
- 214. (DA) MODERN ARCHITECTURE (3:3:0) Architecture and related arts of sculpture and painting from the end of the eighteenth century to the present day. Nontechnical in nature.
- 305. (DA) EUROPEAN ART FROM 1780-1860 (3:3:0) A survey of painting and sculpture in Europe from the beginnings of Neoclassicism through the Realist movement. Prerequisite: ART H 100 or 110 or 112.
- 307. (DA) AMERICAN ART (3:3:0) History of art in the English colonies and the United States from the seventeenth century to the present.

THE ARTS (ARTS)

- 001. (GA) THE ARTS (3:3:0) Developing perception in the arts through relating the visual, musical, performing, and environmental arts.

ASTRONOMY (ASTRO)

001. (GN) ASTRONOMICAL UNIVERSE (3:3:0) Nonmathematical description of the astronomical universe and the development of scientific thought. For nonscience majors. Students who have passed ASTRO 090 may not schedule this course.
- *010. (GN) ELEMENTARY ASTRONOMY (2:2:0) Nonmathematical description of stars, planets, galaxies, and the universe. For nonscience majors. Students who have passed ASTRO 001 or 090 may not schedule this course.

BIOCHEMISTRY (BIOCH)

001. (GN) BIOCHEMICAL SCIENCE (3:3:0) Biochemistry of important functions of man and animals, including genetics, nutrition, metabolic and disease processes, and environmental relationships.

BIOLOGICAL SCIENCE (BI SC)

001. (GN) STRUCTURE AND FUNCTION OF ORGANISMS (3:3:0) Origin, development, and cellular basis of life; fundamental principles, processes, and structures of organisms. Students who have passed BIOL 027, 041, 101, or 102 may not schedule this course.
002. (GN) GENETICS, ECOLOGY, AND EVOLUTION (3:3:0) How living organisms pass on their inheritance, how plants and animals came to be what they are, and how they now react. Students who have passed BIOL 033, 101, 102, or 222 may not schedule this course.
003. ENVIRONMENTAL SCIENCE (3:3:0) Kinds of environments; past and present uses and abuses of natural resources; disposal of human wastes; prospects for the future. Students who have passed BIOL 210 or any other upper-level ecology course in biology may not schedule this course.
004. HUMAN BODY: FORM AND FUNCTION (3:3:0) A general survey of structure and function—from conception, through growth and reproduction, to death. Students who have passed BIOL 029 and 041 may not schedule this course.

BIOLOGY (BIOL)

027. INTRODUCTION TO PLANT BIOLOGY (3:2:2) Cellular structure and organization; physiological processes; classification; reproduction and development; relationship of plant groups. Students who have passed BIOL 102 may not schedule this course.
029. MAMMALIAN ANATOMY (4:2:4) Anatomy of a mammal, with special reference to that of man. Students who have passed BIOL 421 may not schedule this course.
033. (DN) HUMAN GENETICS (3:3:0) Human heredity and its individual and social implications. Students who have passed BIOL 222 may not schedule this course.
041. PHYSIOLOGY (3:3:0) Normal functions of the animal body, with special reference to those of man. Students who have passed BIOL 472 may not schedule this course.
042. PHYSIOLOGY LABORATORY (1:0:2) Experiments demonstrating basic physiological principles, with special reference to man. Prerequisite or concurrent: BIOL 041.
101. (DN) PRINCIPLES OF BIOLOGY I (4:3:2) Introduction to cell biology; biology of vertebrates; overview of monerans, protists, and animals.
102. (DN) PRINCIPLES OF BIOLOGY II (4:3:2) Continuation of BIOL 101, with emphasis on plants and fungi; genetics of organisms and populations; evolution. Prerequisite: BIOL 101.

*Students must take a combination of ASTRO 010 and 011 in order to obtain General Education credits in astronomy.

BIOMEDICAL EQUIPMENT TECHNOLOGY (B E T)

801. **PHYSIOLOGICAL TRANSDUCERS (5:4:2)** Study of the principles of operation and applications of devices used for the conversion of physiological events to electrical signals. Prerequisite: EE T 810.

802. **BIOMEDICAL INSTRUMENTATION AND SYSTEMS (5:4:2)** Introduction to the operating principles, calibration, and maintenance of biomedical instruments and systems with special emphasis given to patient safety. Prerequisite: B E T 801.

803. **BIOMEDICAL EQUIPMENT LABORATORY (Internship) (4:1:6)** Practical experience, within or related to the hospital environment, on a variety of biomedical instruments. Prerequisites: B E T 804, BIOL 041.

804. **MEDICAL AND CLINICAL EQUIPMENT (3:2:2)** Principles of operation of clinical, medical radiography, intensive care, anesthesia, respiratory, non-invasive imaging, and emergency equipment; hospital electrical safety. Prerequisite: B E T 801.

830. **SELECTED TOPICS IN BIOMEDICAL EQUIPMENT TECHNOLOGY (3)** Individual or group work in biomedical equipment technology for students with specific occupational objectives. Prerequisite: third-semester standing.

BUSINESS ADMINISTRATION (B A)

100. **INTRODUCTION TO BUSINESS (3:3:0)** A comprehensive view of the contemporary environment of business.

250. **PROBLEMS OF SMALL BUSINESS (3:3:0)** Analysis of problems of the small firm, particularly for the student who wishes to venture into business. Prerequisite: 3 credits in economics.

803. **COOPERATIVE PRACTICUM WITH BUSINESS OFFICES (3-6)** Cooperative practical work with business offices under the supervision of the instructor.

BUSINESS LAW (B LAW)

243. **LEGAL ENVIRONMENT OF BUSINESS (3:3:0)** Social control through law: courts, basic policies underlying individual and contractual rights in everyday society. Prerequisite: third-semester standing.

850. **REAL ESTATE LAW (3:3:0)** Basic legal principles involved in the negotiation of real estate transactions.

BUSINESS LOGISTICS (B LOG)

301. **BUSINESS LOGISTICS MANAGEMENT (3:3:0)** Management of logistics function in firm, including physical supply and distribution activities such as transportation, storage facility location, and materials handling. Prerequisite: third-semester standing.

304. **TRANSPORT SYSTEMS (3:3:0)** Conceptual model of a transport system; environmental relationships; modal components and managerial conditions, with special application to the United States.

305. **TRAFFIC MANAGEMENT (3:3:0)** Analysis of the traffic function in the logistics system. Evaluation of routes, rates, and shipping document procedures. Prerequisite: B LOG 301 or 304.

CHEMICAL ENGINEERING TECHNOLOGY (CH ET)

810. **CHEMICAL TECHNOLOGY (4:4:0)** Industrial stoichiometry, material balances, heats of reaction. Prerequisite or concurrent: CHEM 013, 015.

811. **CHEMICAL TECHNOLOGY (5:5:0)** Fluid flow, heat transfer, evaporation, distillation, air-water interaction. Prerequisite: CH ET 810.

821. **CHEMICAL TECHNOLOGY LABORATORY (2:1:2)** Measurements in stoichiometry, material balances, and heats of reaction; industrial laboratory report writing. Prerequisite or concurrent: CH ET 810.
822. **CHEMICAL TECHNOLOGY LABORATORY (2:1:2)** Measurements in fluid flow, heat transfer, distillation, mass transfer; chemical analytical techniques. Prerequisite or concurrent: CH ET 811.
830. **INDUSTRIAL CHEMISTRY (3:3:0)** The commercial preparation of important chemicals and derivatives with emphasis upon the chemistry involved and the flow of material. Prerequisite or concurrent: CHEM 013, 015.
831. **SELECTED TOPICS IN CHEMICAL ENGINEERING TECHNOLOGY (3)** Individual or group work in chemical engineering technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.

CHEMISTRY (CHEM)

011. **INTRODUCTORY CHEMISTRY (3:2:2)** Selected principles and applications of chemistry. Prior study of chemistry not assumed.
012. (DN) **CHEMICAL PRINCIPLES (3-4)** Basic concepts and quantitative relations. Prerequisite: Satisfactory performance on placement examination—students take CHEM 012 for 3 credits. Unsatisfactory performance on placement examination—students take CHEM 012 for 4 credits.
013. (DN) **CHEMICAL PRINCIPLES (3:3:0)** Continuation of CHEM 012, including introduction to the chemistry of the elements. Prerequisite: CHEM 012 or 017. Prerequisite or concurrent: CHEM 014.
014. (DN) **EXPERIMENTAL CHEMISTRY (1:0:3)** Introduction to quantitative experimentation in chemistry. Prerequisite or concurrent: CHEM 012.
015. (DN) **EXPERIMENTAL CHEMISTRY (1:0:3)** Continuation of CHEM 014, with emphasis on analytical procedures. Prerequisite: CHEM 014. Prerequisite or concurrent: CHEM 013.
017. (DN) **INTRODUCTORY AND GENERAL CHEMISTRY (5:5:2)** Introductory and general chemistry for students who are required to take additional chemistry, e.g., CHEM 013, but are unprepared for CHEM 012. Students may not receive credit for both CHEM 017 and CHEM 011 or 012.
023. **INTRODUCTION TO MODERN ANALYTICAL CHEMISTRY (4:2:4)** Contemporary methods of chemical and instrumental analysis, including potentiometric titration, specific ion electrodes, spectrophotometry, and chromatography. Prerequisite: CHEM 015.
034. **ORGANIC CHEMISTRY (3:3:0)** Introduction to organic chemistry, with emphasis on the properties of organic compounds of biochemical importance. Not open to those who have previously scheduled CHEM 037. Prerequisite: CHEM 011 or 012 or 017.
035. **ORGANIC CHEMISTRY (3:2:4)** Introduction to organic chemistry, with emphasis on the identification of organic compounds by characteristic chemical reactions and by spectroscopy. Prerequisite: CHEM 034.
036. **LABORATORY IN ORGANIC CHEMISTRY (2:0:6)** Basic laboratory operations; applications of theories and principles. Prerequisite: CHEM 038. Prerequisite or concurrent: CHEM 039 or 040.
037. **ORGANIC CHEMISTRY (3:3:0)** Introduction to organic chemistry, with emphasis on topics of particular relevance to mineral science, materials science, and engineering. Not open to those who have previously scheduled CHEM 034. Prerequisite: CHEM 011 or 012.
038. **ORGANIC CHEMISTRY (4:4:0)** Principles and theories; nomenclature; chemistry of the functional groups; applications of spectroscopy. Students may not receive credit for both CHEM 038 and 034. Prerequisite: CHEM 013.
039. **ORGANIC CHEMISTRY (3:3:0)** Continuation of CHEM 038 to include especially polyfunctional organic molecules and the organic chemistry of biologically important molecules. Students may not receive credit for both CHEM 039 and 040. Prerequisite: CHEM 038.

040. **ORGANIC CHEMISTRY (2:2:0)** Continuation of CHEM 038 to include especially poly-functional organic molecules. Students may not receive credit for both CHEM 039 and 040. Prerequisite: CHEM 038.
102. **ENVIRONMENTAL CHEMISTRY (3:3:0)** Applications of chemistry to environmental problems, including air, water, thermal pollution; pesticides; drugs and birth control agents; food additives; etc. For non-Chemistry majors; Chemistry majors will not receive credit.
389. **SPECIAL PROBLEMS AND RESEARCH (1-4)** Designed for freshman or sophomore students who are prepared to undertake special problems and research by arrangement with a faculty member.
395. **CHEMISTRY TEACHER ASSISTANT TRAINING (1-2)** Instruction and practice in the role of the teaching assistant in the undergraduate chemistry laboratory.

CIVIL ENGINEERING TECHNOLOGY (CE T)

809. **TOPOGRAPHIC DRAWING (2:0:4)** Conventional mapping symbols; constructing topographic maps from stadia notes; estimating grading quantities from topographic maps. Prerequisite: E G 001 or 010. Prerequisite or concurrent: CE T 811 or WILD 802.
810. **STATISTICS AND LEAST SQUARES (3:3:0)** Frequency distribution; histograms; frequency polygons; measures of central tendency; dispersion; uses of normal curve; least squares applied to surveying problems. Prerequisite: MATH 088.
811. **PLANE SURVEYING (3:2:3)** Theory of plane surveying; use, care, and adjustments of surveying equipment; traversing, areas, leveling, stadia, and plane table mapping. Prerequisite: MATH 087.
812. **CURVES AND EARTHWORK (3:2:3)** Computation and laying out of horizontal and vertical curves; calculation of cut and fill; setting slope stakes for construction. Prerequisite or concurrent: CE T 811, MATH 087.
813. **PRACTICAL FIELD PROBLEMS (4:1:9)** Geodetics, topography, field astronomy; route location; hydrographic surveys; land subdivision; use of electronic measuring devices. Prerequisites: CE T 812, 818.
814. **PHOTOGRAMMETRY (3:1:4)** Interpretation and use of aerial photographs; mapping by photogrammetric methods; application of aerial and terrestrial photographic surveying to specific engineering problems. Prerequisite: CE T 818.
815. **GEODETIC SURVEYING (3:1:4)** Precision vertical and horizontal control surveys; level nets; reciprocal leveling; triangulation; state plane coordinates; astronomic observations for azimuth and latitude. Prerequisites: CE T 811, MATH 087.
816. **SPECIAL SURVEYS (3:1:4)** Applications of surveying in hydrography, mining, construction, and subdivision planning; surveying registration law and professional ethics. Prerequisites: CE T 812, 813.
817. **CARTOGRAPHIC TECHNIQUES (2:0:4)** Use of tools and equipment; projections used in art, advertising, navigation, government maps; relief methods; scribing techniques; map reproduction methods. Prerequisite: CE T 809.
818. **ROUTE SURVEYING (2:0:4)** Field and office operations connected with highway and railroad location; mass diagram as related to economical distribution of earthwork. Prerequisite: CE T 811. Concurrent: CE T 812.
821. **CONCRETE TECHNOLOGY (3:2:2)** Characteristics of portland cement concrete, physical properties of constituent materials, testing procedures, basics of reinforced concrete. Prerequisite or concurrent: E MCH 813.
822. **SOIL MECHANICS (3:2:2)** Identification, classification, sampling, testing, handling, and consolidation of soils for highway construction. Prerequisites: E MCH 811, PHYS 151.
823. **HIGHWAY ORGANIZATION AND OPERATIONS (3:2:2)** Fundamentals of technology; plans and specifications; drainage, cost, traffic studies, and highway safety. Prerequisite: second-year standing in Highway Engineering Technology.

COMMUNICATIONS

824. ASPHALT TECHNOLOGY (3:2:2) The use and testing of asphaltic material as adapted to highways.
825. CONSTRUCTION ESTIMATING (3:2:2) Job organization, estimating, cost control, construction methods and equipment for highway construction projects.
830. SELECTED TOPICS IN CIVIL ENGINEERING TECHNOLOGY (3) Individual or group work in civil engineering technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.
840. HYDROLOGY AND DRAINAGE (3:2:2) Introduction to railway hydrology and drainage, soil studies, erosion control, and hydraulic design of culverts. Prerequisites: CE T 809, 811.
841. ECONOMIC RAILWAY LOCATION AND GEOMETRIC DESIGN (3:2:2) Railway economics, history, design, and maintenance of vertical and horizontal curves; speed and superelevation. Prerequisites: CE T 812; CE T 816 or 818.
842. RAILWAY TRACK MAINTENANCE AND OPERATION (3:2:2) Specifications for safety standards for track, programming maintenance operations, track inspection. Prerequisite: CE T 841. Concurrent: CE T 843.
843. RAILWAY TRACK STRUCTURE DESIGN AND CONSTRUCTION (3:2:2) Design, layout, and construction of yards, turnouts, interlocking plants, and structures. Prerequisite or concurrent: E MCH 813. Concurrent: CE T 842.
861. FLUID FLOW (3:3:0) Elementary theory of fluid flow: hydrostatics; flow through orifices, Venturi meters, and pipes; flow in open channels; theory of the centrifugal pump. Prerequisites: E MCH 811, MATH 087.
890. LEGAL ASPECTS OF SURVEYING (2:2:0) Legal principles affecting the determination of property boundaries; responsibilities of surveyors, attorneys, title companies, and the court. Prerequisite: CE T 811.

COMMUNICATIONS (COMM)

100. (GS) THE MASS MEDIA AND SOCIETY (3:3:0) Mass communications in the United States; organization, role, content, and effects of newspapers, magazines, television, radio, books, and films. May not be used to fulfill requirements of any major in the School of Communications.
150. (GA) THE ART OF THE CINEMA (3:1:3) The development of cinema to its present state; principles of evaluation and appreciation; examples from the past and present.
205. WOMEN, MINORITIES, AND THE MEDIA (3:3:0) Analysis of historical, economic, legal, political, and social implications of the relationship between women, minorities, and the mass media.
260. NEWS WRITING AND REPORTING (3:2:2) News and news values; legal and ethical problems of reporting; writing and reporting news for the mass media. Prerequisites: typing proficiency; and ENGL 030, fourth-semester standing; or ENGL 202A or 202B.

COMPUTER SCIENCE (CMPSC)

001. BASIC COMPUTER PROGRAMMING (1:0:2) Fundamental characteristics of digital computers; organization and coding of problems for solution on digital computer. Prerequisite: 2 entrance units in mathematics.
100. COMPUTER FUNDAMENTALS AND APPLICATIONS (3:3:0) Introduction to computer fundamentals and applications to data processing environments. Prerequisite: 2 entrance units in mathematics.
101. (GQ) INTRODUCTION TO ALGORITHMIC PROCESSES (3:3:0) Properties of algorithms, languages, and notations for describing algorithms; applications of a procedure-oriented language to problem solving. Students who have passed CMPSC 201 or 203 may not schedule this course. Prerequisite: 2 entrance units in mathematics.

102. **COMPUTER ORGANIZATION AND PROGRAMMING (3:3:0)** Computer components and organization, representation of numbers and characters, instruction codes, machine language, programming, assembly systems, input-output, subroutines, and macros. Prerequisite: CMPSC 101.
120. **INTERMEDIATE PROGRAMMING (4:3:2)** Systematic programming: top-down program development, documentation, and testing. Verification of program correctness. Introduction to data structures, numerical methods. Prerequisites: CMPSC 101 or 201; MATH 140.
140. **INTRODUCTION TO DATA PROCESSING (3:3:0)** Applications of digital computers to problems in data processing with examples from accounting, record updating, inventory control, and report generation. Prerequisite: CMPSC 101.
142. **PROGRAMMING SYSTEMS FOR SMALL BUSINESS (3:3:0)** Business applications programming and systems design applicable to the small business environment. Prerequisite: CMPSC 140.
144. **DATA ORGANIZATION AND ACCESSING TECHNIQUES (4:3:2)** Design characteristics of external storage devices; record organizations; accessing considerations for sequential, direct, relative, and indexed files; internal data structures. Prerequisites: CMPSC 102, 140.
154. **ADVANCED ASSEMBLER, I/O TECHNIQUES, AND JOB CONTROL LANGUAGES (3:3:1)** Macro-expansion; assembler-level I/O control; COBOL-assembler linkage conventions; advanced debugging techniques; assembler design; op-system features and JCL techniques. Students may not take both CMPSC 154 and 442 for credit. Prerequisite: CMPSC 144.
164. **CONTEMPORARY TRENDS IN COMPUTER PROGRAMMING (3:3:0)** State of the technology in design, code, test, and documentation techniques for information processing systems and large EDP production programs. Students may not take both CMPSC 164 and 444 for credit. Prerequisite: CMPSC 154.
174. **ANALYSIS AND DESIGN OF INFORMATION SYSTEMS (2:1:2)** The organization, flow charting, programming, debugging, and documentation of a major applied problem in a field of computer application. Prerequisite: third-semester standing.
175. **IMPLEMENTATION OF INFORMATION SYSTEMS (1:0:2)** Implementation and evaluation of an information system as designed in CMPSC 174 with peer review of the design. Prerequisite: CMPSC 174.
201. **(GQ) COMPUTER PROGRAMMING FOR ENGINEERS (3:3:0)** Development and implementation of algorithms in a procedure-oriented language, with emphasis on numerical methods for engineering problems. Students who have passed CMPSC 101 or 203 may not schedule this course. Prerequisite: MATH 141.
203. **(GQ) PRINCIPLES OF PROGRAMMING WITH BUSINESS APPLICATIONS (3:2:2)** Programming in a high-level language. Introduction to networks, data communications, database terminology. Packaged software: statistical, spread-sheet, word/text processing. For business students. Students who have passed CMPSC 101, 103, or 201 may not schedule this course. Prerequisite: 2 entrance units in mathematics.
211. **INTRODUCTION TO SYSTEMS PROGRAMMING (3:2:2)** Review of computer architecture concepts; assembly language programming, I/O routines, linkage and loading; microprocessor and large computer assembly languages. Prerequisite: CMPSC 120. Concurrent: E E 271.
803. **COMPUTER APPLICATIONS IN BUSINESS (3:3:0)** Characteristics of digital computers; the role of data processing in business; programming in a high-level language. Designed for two-year Business Administration students. Students who have passed CMPSC 101, 201, or 203 may not schedule this course.
804. **COMPUTER FUNDAMENTALS AND APPLICATIONS (2:2:0)** Types of computers and computer systems; storage and I/O devices; number systems and data representation; computer applications; typical EDP organization.
890. **SPECIAL TOPICS IN COMPUTER PROGRAMMING (1-3)** Application of any of several specific computer programming languages to problem solving. Prerequisite: CMPSC 101.

CURRICULUM AND INSTRUCTION (C I)

295. INTRODUCTORY FIELD EXPERIENCE FOR TEACHER PREPARATION (2-3 per semester, maximum of 6) Selected observation of schooling situations with small group and tutorial participation. Prerequisite: second-semester standing. Concurrent: EDTHP 115 and/or EDPSY 014.

DIETETIC FOOD SYSTEMS MANAGEMENT (D S M)

100. THE PROFESSION OF DIETETICS (1:1:0) Introduction to the profession and exploration of the roles and responsibilities of dietetic professionals.

103. INTRODUCTION TO HEALTH FACILITIES FOOD SERVICE ADMINISTRATION (3:3:0) Professional functions of the hospital food service system, relationships with the nutrition component of food service system, and organization served.

205. HUMAN RELATIONS AND DIETETIC SUPERVISORY SKILLS (3:3:0) Theories and principles of supervision and training of food service employees for overall operational effectiveness.

250. QUANTITY FOOD PRODUCTION MANAGEMENT (4:3:1) Systems approach to managing quantity food production functions in health care settings; included are quantity food production principles and standards.

260. MANAGEMENT OF FOOD SERVICE OPERATING SYSTEMS (4:3:1) Major principles related to managing the purchasing, food, and labor subsystems of a health care food service system. Prerequisite: D S M 250.

270. QUALITY ASSURANCE FOR DIETETIC MANAGEMENT (2:2:0) Theories, principles, and methods of managing quality dietetic services. Prerequisites: D S M 103, NUTR 252.

295. PROFESSIONAL STAFF FIELD EXPERIENCE (4:3:1) Methods of, and practice in, the client-oriented dietetic systems in health care facilities. Prerequisites: D S M 260, 304.

304. MARKETING OF FOOD SERVICES IN HEALTH CARE FACILITIES (3:3:0) Theories and applications of marketing principles to the design of consumer-oriented dietetic services.

EARTH SCIENCE (EARTH)

001. EARTH SCIENCE (3:3:0) Integrated approach to fundamental problems in the earth sciences. Fields of study include geological sciences, physical geography, and meteorology. No credit will be given for this course if a student takes GEOSC 020, GEOG 019, or METEO 002.

ECONOMICS (ECON)

002. (GS) INTRODUCTORY MICROECONOMIC ANALYSIS AND POLICY (3:3:0) Methods of economic analysis and their use; economic aggregates; price determination; theory of the firm; distribution.

004. (GS) INTRODUCTORY MACROECONOMIC ANALYSIS AND POLICY (3:3:0) National income measurement; aggregate economic models; money and income; policy problems.

014. (GS) PRINCIPLES OF ECONOMICS (3:3:0) Analysis of the American economy, emphasizing the nature and interrelationships of such groups as consumers, business, governments, labor, and financial institutions. Students who have passed ECON 002 or 004 or are registered in the College of Business Administration may not schedule this course.

302. (DS) INTERMEDIATE MICROECONOMIC ANALYSIS (3:3:0) Allocation of resources and distribution of income within various market structures, with emphasis on analytical tools. Prerequisite: ECON 002.

315. (DS) LABOR ECONOMICS (3:3:0) Economic analysis of employment, earnings, and the labor market; labor relations; related government policies. Prerequisite: ECON 002.

EDUCATIONAL PSYCHOLOGY (EDPSY)

014. LEARNING AND INSTRUCTION (3:3:0) Psychology of human learning applied toward the achievement of educational goals; evaluation of learning outcomes.
297. SPECIAL TOPICS (1-9)

EDUCATIONAL THEORY AND POLICY (EDTHP)

115. EDUCATION IN AMERICAN SOCIETY (3:3:0) Introduction to the development of educational institutions, with emphasis on historical, philosophical, and sociological forces.

ELECTRICAL ENGINEERING TECHNOLOGY (EE T)

800. APPLIED ELECTRICITY (2:1:2) Fundamentals of electric circuits; basic principles of electrical machinery and devices; electrical-mechanical analogies; beginning electronics. Prerequisite: MATH 087.
801. FUNDAMENTALS OF ELECTRICAL CIRCUITS (4:4:0) Fundamental theory of resistance, current, voltage. Direct-current concepts from simplest series circuits through Thevenin's theorem; single-phase circuit fundamentals. Prerequisite or concurrent: MATH 087.
804. A.C. CIRCUITS (2:2:0) Application of network theorems, laws, and methods to alternating-current circuits; balanced and unbalanced polyphase systems. Prerequisite: EE T 814.
805. SEMICONDUCTOR LABORATORY (1:0:2) Laboratory study of semiconductors. Assembly and tracing of electronic circuits. Concurrent: EE T 810.
806. A.C. CIRCUITRY LABORATORY (1:0:2) Laboratory study of alternating-current circuits; assembly and tracing of electrical circuits. Concurrent: EE T 804.
809. ELECTRICAL CIRCUITS LABORATORY (1:0:2) Introduction to electrical apparatus, including instruments, their interconnection into basic circuits, observation of circuit behavior, and report writing. Concurrent: EE T 801.
810. FUNDAMENTALS OF SEMICONDUCTORS (3:3:0) Semiconductor physics and circuit theory including hybrid parameters; equivalent circuits; power amplifiers and frequency response of small signal amplifiers. Prerequisite or concurrent: EE T 814, MATH 088.
811. MICROPROCESSORS (3:2:2) Fundamentals of microprocessors, their application, and interfacing for data processing and control. Prerequisite: EE T 814.
813. FUNDAMENTALS OF ELECTRICAL MACHINES (3:2:2) Direct-current machinery principles and applications; introduction to machines and basic concepts of laboratory methods related to machinery studies. Prerequisites: EE T 814, 818.
814. ELECTRICAL CIRCUITS (3:3:0) Direct-current circuit analysis; introduction to basic magnetism and magnetic circuits; single-phase circuit fundamentals. Prerequisites: EE T 801, MATH 087.
815. A.C. MACHINERY AND CONTROL (3:3:0) Alternating-current machinery principles and applications; survey of alternating- and direct-current machinery control methods. Prerequisites: EE T 804, 813.
816. LINEAR ELECTRONIC CIRCUITS (3:3:0) Theoretical study of linear electronic devices and circuits, including field effect transistors, integrated circuits, and operational amplifiers. Prerequisite: EE T 810.
817. DIGITAL ELECTRONICS (4:4:0) Fundamentals of digital circuits, including logic circuits, boolean algebra, counters, A/D and D/A converters, and introduction to computer operation. Prerequisite: EE T 810.
818. ELECTRICAL CIRCUITS LABORATORY (2:0:4) Laboratory study of direct-current networks and alternating-current circuits. Prerequisite: EE T 809. Concurrent: EE T 814.
819. A.C. MACHINERY LABORATORY (1:0:2) Alternators, induction generators, single- and polyphase motors, synchro units, transformers, saturable reactors, and protective devices. Prerequisite: EE T 806. Concurrent: EE T 815.

820. **DIGITAL ELECTRONICS LABORATORY (1:0:2)** Laboratory study of solid state pulse, digital, industrial, and motor control circuits. Prerequisite: EE T 805. Concurrent: EE T 817.
821. **LINEAR ELECTRONICS LABORATORY (1:0:2)** Laboratory study of transistors; study of differential and operational amplifiers. Emphasis is placed on circuit design. Prerequisite: EE T 805. Concurrent: EE T 816.
830. **SELECTED TOPICS IN ELECTRICAL ENGINEERING TECHNOLOGY (3)** Individual or group work in electrical engineering technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.

ENGINEERING (ENGR)

002. **ENGINEERING ORIENTATION (1:0:2)** Introduction to efficient methods for analyzing and solving engineering problems.
005. **EXPERIMENTAL METHODS FOR ENGINEERS (1:0:2)** Introduction to experimental methods used in engineering. Applications of basic experimental and computational concepts through student involvement in laboratory experiments.

ENGINEERING GRAPHICS (E G)

001. **ENGINEERING GRAPHICS (2:1:3)** Technical skills and drafting room practices; fundamentals of theoretical graphics; orthogonal, oblique, and perspective projections; working and schematic drawings.
003. **ARCHITECTURAL GRAPHICS (2:0:6)** Principles of architectural drawing; spatial relationships of points, lines, planes, and solids, with architectural applications; shadows, perspective.
010. **INTRODUCTORY ENGINEERING GRAPHICS (1:0:3)** Multiview projections, pictorial drawings, dimensioning, engineering standards, and working drawings.
011. **ENGINEERING DESIGN GRAPHICS (1:0:3)** Introduction to creative design, space analysis, graphs, graphical mathematics, vector analysis, and design implementation. Prerequisite: E G 010 or 021.
012. **SPATIAL ANALYSIS (2:1:3)** Spatial relations of points, lines, and solids, with engineering applications. Prerequisite: 1 credit of introductory graphics.
050. **ENGINEERING METHODS AND GRAPHICAL COMMUNICATION (3:1:5)** Introduction to engineering through graphics (multiviews, pictorials, dimensioning, space analysis); microcomputer literacy in BASIC, with computer graphics and instrumentation laboratory.
803. **ADVANCED ENGINEERING DRAWING (3:1:4)** Application of principles of engineering drawing, including auxiliary views in the layout of detail, assembly, and working drawings. Prerequisite: E G 001.
830. **SELECTED TOPICS IN ENGINEERING GRAPHICS (1-3)** Individual or group work in engineering graphics offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.

ENGINEERING MECHANICS (E MCH)

810. **BASIC MECHANICS (2:2:0)** Forces; moments; resultants; equilibrium of force systems; introduction to dynamics. Prerequisite: MATH 087.
811. **ELEMENTARY MECHANICS (3:3:0)** Forces; moments; resultants; equilibrium of force systems; friction; centroids and moment of inertia of areas; dynamics of particles. Prerequisite: MATH 087.
812. **INTRODUCTION TO DYNAMICS (3:2:2)** Absolute and relative motion related to particles and simple linkages. Force-mass-acceleration, work-energy, and impulse-momentum solution techniques. Prerequisite: E MCH 811. Prerequisite or concurrent: MATH 088.

813. **STRENGTH AND PROPERTIES OF MATERIALS (3:3:0)** Axial stress and strain; shear; riveted and welded connections; torsion; beam stresses and deflections; combined axial and bending stresses; columns, ductility, resilience, and toughness. Prerequisite: E MCH 811.

814. **STRENGTH OF MATERIALS LABORATORY (1:0:2)** Measurement of mechanical properties of materials; structural testing. Concurrent: E MCH 813.

ENGLISH (ENGL)

004. **BASIC WRITING SKILLS (3:3:0 per semester, maximum of 6)** Intensive practice in writing sentences and paragraphs and instruction in grammar, usage, and punctuation. Designed for students with deficient preparation. *This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program.*

005. **WRITING TUTORIAL (1:0:2)** Tutorial instruction in composition and rhetoric for students currently enrolled in ENGL 004 or 015. *This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program.*

015. (GWS) **RHETORIC AND COMPOSITION (3:3:0)** Instruction and practice in writing expository prose that shows sensitivity to audience and purpose. Prerequisite: ENGL 004 or satisfactory performance on the English proficiency examination.

030. (GWS) **HONORS FRESHMAN COMPOSITION (3:3:0)** Writing practice for specially qualified and screened students. Students who have passed a special writing test will qualify for this course.

101. **UNDERSTANDING LITERATURE (3:3:0)** Introduction to the human and artistic values in selected short stories, novels, poems, and plays. Intended for nonmajors.

102. **GREAT BOOKS OF BRITISH LITERATURE (3:3:0)** Introduction to British literature through the reading and discussion of significant works. Intended for nonmajors.

103. **GREAT BOOKS OF AMERICAN LITERATURE (3:3:0)** Introduction to American literature through the reading and discussion of significant works. Intended for nonmajors.

104. (DH) **THE BIBLE AS LITERATURE (3:3:0)** Study of the English Bible as a literary and cultural document.

129. (DH) **SHAKESPEARE (3:3:0)** A selection of the major plays studied to determine the sources of their permanent appeal. Not recommended for English majors.

133. (DH) **MODERN AMERICAN LITERATURE TO WORLD WAR II (3:3:0)** Eliot, Frost, Faulkner, Fitzgerald, Hemingway, O'Neill, and other writers representative of the years between the world wars.

134. (DH) **AMERICAN COMEDY (3:3:0)** Studies in American comedy and satire, including such writers as Mark Twain, Faulkner, Vonnegut, and Heller.

139. (DH) **BLACK AMERICAN LITERATURE (3:3:0)** Fiction, poetry, and drama, including such writers as Baldwin, Douglass, Ellison, Morrison, and Wright.

140. (DH) **CONTEMPORARY LITERATURE (3:3:0)** Writers such as Barth, Beckett, Bellow, Ellison, Lowell, Mailer, Pinter, Plath, and Vonnegut.

165. (DH) **GREAT ENGLISH NOVELS (3:3:0)** Introduction to selected major novels by such writers as Defoe, Fielding, Austen, Brontë, Dickens, Hardy, Conrad, Joyce, Lawrence, and Woolf.

167. (DH) **POETRY (3:3:0)** Introduction to the appreciation and analysis of English and American poetry.

168. (DH) **DRAMA (3:3:0)** Introduction to the range of dramatic expression in selected plays, primarily English and American.

184. (C LIT 184) **THE SHORT STORY (3:3:0)** Lectures, discussions, readings in translation, with emphasis on major writers of the classical, medieval, Renaissance, and modern periods.

185. (C LIT 185) **THE MODERN NOVEL IN WORLD LITERATURE (3:3:0)** Development of the modern novel in the last century (outside the British Isles and the United States); lectures, discussions, readings in translation.

189. (CLIT 189) FOUNDATIONS OF MODERN DRAMA (3:3:0) Playwrights who set the world's stage for twentieth-century drama: Ibsen, Shaw, Chekhov, and Strindberg.
191. SCIENCE FICTION (3:3:0) Science fiction as the literature of technological innovation and social change—its development, themes, and problems.
192. THE LITERATURE OF FANTASY (3:3:0) Major realms of fantasy in English and American literature: daydream and nightmare, the pastoral, dystopia, utopia, apocalypse, and the heroic.
194. (DH) WOMEN WRITERS (3:3:0) Short stories, novels, poetry, drama, and essays by major English and American women writers since 1870.
196. (AM ST 196) INTRODUCTION TO AMERICAN FOLKLORE (3:3:0) A basic introduction to verbal and nonverbal folklore, stressing the basic procedures of collection, classification, and analysis.
197. (AM ST 197) AMERICAN FOLK SONG IN ENGLISH (3:3:0) British songs in America; native repertoires, white and black; folk ballad; and musical development.
- 202A. (GWS) EFFECTIVE WRITING: WRITING IN THE SOCIAL SCIENCES (3:3:0) Instruction in writing persuasive arguments about significant issues in the social sciences. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 or 030; fourth-semester standing.
- 202B. (GWS) EFFECTIVE WRITING: WRITING IN THE HUMANITIES (3:3:0) Instruction in writing persuasive arguments about significant issues in the humanities. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 or 030; fourth-semester standing.
- 202C. (GWS) EFFECTIVE WRITING: TECHNICAL WRITING (3:3:0) Writing for students in scientific and technical disciplines. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 or 030; fourth-semester standing.
- 202D. (GWS) EFFECTIVE WRITING: BUSINESS WRITING (3:3:0) Writing reports and other common forms of business communication. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 or 030; fourth-semester standing.
297. SPECIAL TOPICS (1-9)
826. REPORT WRITING (3:3:0) Interpretation of statistical data and writing of technical reports. Prerequisite: ENGL 004 or 015.

FINANCE (FIN)

100. INTRODUCTION TO FINANCE (3:3:0) The nature, scope, and interdependence of the institutional and individual participants in the financial system. A student may not receive credit toward graduation for both FIN 100 and FIN 301. Prerequisite: third-semester standing.
108. PERSONAL FINANCE (3:3:0) Personal management of budgets, bank accounts, loans, credit buying, insurance, real estate, and security buying. May not be scheduled by College of Business Administration students. Prerequisite: third-semester standing.
297. SPECIAL TOPICS (1-9)
301. CORPORATION FINANCE (3:3:0) The acquisition and management of corporate capital; analysis of operations, forecasting capital requirements, raising capital, and planning profits. Prerequisites: ACCTG 101; ECON 002, 004; MATH 110; Q B A 101.
810. COMMERCIAL BANK MANAGEMENT (3:3:0) Managerial processes within the banking industry.

FORESTRY (FOR)

- 105. FOREST MENSURATION (3:2:3) Measurement of forests and forest products.
- 106. FOREST INVENTORIES (3:2:4) Application of land surveying and sampling techniques, including statistical analysis, for the determination of timber volume and growth.
- 108. FIELD STUDIES IN ECOLOGY (1) Field studies in ecological problems, challenges, and impacts related to normal forest practices in general resource management. Prerequisite: FOR 826.
- 137. INTRODUCTION TO HARVESTING (1:0:4) Field application of harvesting techniques, including sale layout and operation of hand and power equipment.
- 138. INTERMEDIATE OPERATIONS (1:0:4) Field practicum in planting, pruning, and thinning of forest stands. Prerequisite: FOR 137.
- 140. LETTERING AND DRAFTING (2:0:4) Freehand, mechanical, transfer lettering skills and drafting room practices.
- 141. FOREST SURVEYING (4:2:8) Plane surveying and mapping techniques as applied to forestry practices. Prerequisite or concurrent: FOR 140, MATH 087.
- 220. FOREST ECOSYSTEM PROTECTION (3:3:0) Principles and concepts involved in managing the forest ecosystem in regard to fires, insects, and diseases.
- 221. FOREST FIRE TECHNOLOGY (1:0:3) Technological aspects of controlling and using fire in the forest environment. Prerequisite: FOR 220.
- 234. RECLAMATION MANAGEMENT (3:2:3) Consideration of various factors of soils, hydrology, and reclamation in the reclaiming and revegetation of disturbed sites. Prerequisite: FOR 141 or 366 or C E 114 or 210.
- 240. SILVICULTURAL PRACTICES (3:2:3) Principles and techniques of forest establishment, culture, regeneration, and harvesting. Prerequisite: FOR 203 or 250.
- 241. AERIAL PHOTO INTERPRETATION (4:2:6) Aerial photo interpretation techniques applied to land management inventories, mapping, road location, and procurement. Prerequisites: FOR 203; FOR 105 and 106, or FOR 366.
- 242. ELEMENTS OF PROJECT SUPERVISION IN FORESTRY (3:3:0) Supervisory techniques developed through an understanding of the behavioral sciences applied to field forestry personnel management.
- 245. MICROCOMPUTERS IN FORESTRY (2:1:2) Computer literacy; elementary programming in basic and software applications in forestry. Prerequisite: FOR 850 or 3 credits in mathematics.
- 250. DENDROLOGY (3:0:6) Taxonomy, identification, ranges, and uses of important U.S. timber species and lesser vegetation of a regional nature.
- 807. FOREST RECREATION (3:2:3) Development, construction, and management of forest recreation areas and facilities. Prerequisite: FOR 141.
- 808. FOREST PROTECTION (3:2:3) Forest fire prevention, detection, behavior, and suppression; fire plans and statistics; insect and disease control.
- 814. FORESTRY LEADERSHIP PRACTICUM (1:0:3) Leadership techniques applied to standard forestry field operations. Prerequisite: FOR 242.
- 817. URBAN FORESTRY (3:2:3) The application of land treatment techniques and forestry practices to urban environments. Prerequisites: FOR 807.
- 818. INDIVIDUAL STUDIES (1-3 per semester) Individual study of forest technology.
- 820. ADVANCED FOREST MEASUREMENTS (1) Application of point and 3P sampling methods as a means of developing the data base for integrated forest management planning. Prerequisites: FOR 809, 826.
- 822. FOREST MANAGEMENT SYSTEMS (2) Field projects and an extended field tour dealing with silvicultural, mensurational, and regulation techniques of forest management. Prerequisite: FOR 240.
- 825. HARVESTING TECHNIQUES (1:0:3) Practical instruction in the operation of heavy equipment used in timber harvesting. Prerequisite: FOR 137.

FRENCH

826. REFORESTATION AND INTERMEDIATE OPERATIONS (1:0:3) Field practicum in planting, pruning, thinning forest stands. Prerequisite: FOR 825.
827. FIELD STUDY PREPARATION (1) Developing practices, procedures, and materials for conducting integrative field studies. Prerequisites: FOR 241.
828. SAWMILL ORIENTATION (1:1:0) An overview of sawmill industry equipment, processes, and products.
829. SAWMILL BUSINESS MANAGEMENT (3:2:3) Fundamental business practices applied to a small sawmill business enterprise. Prerequisite: FOR 828.
830. SAWMILL OPERATION (3:2:3) Technical and applied aspects of sawmilling. Prerequisite: FOR 828.
831. SAWMILL OPERATION PRACTICUM (4) Extended hands-on experience to develop operational competencies in running a small sawmill. Prerequisite: FOR 830.
850. FORESTRY QUANTIFICATION (4:4:0) Principles of quantification applied to natural resources management and surveying.
860. FOREST VALUATION (1) Gathering and analyzing cost and production data related to stumpage valuation and equipment management. Prerequisite: FOR 106.

FRENCH (FR)

001. ELEMENTARY FRENCH I (4:4:0) Grammar, with reading and writing of simple French; oral and aural work stressed. Students who have received high school credit for two or more years of French may not schedule this course for credit without permission of the department.
002. ELEMENTARY FRENCH II (4:4:0) Grammar and reading continued; oral and aural phases progressively increased. Students who have received high school credit for four years of French may not schedule this course for credit without permission of the department. Prerequisite: FR 001.
003. INTERMEDIATE FRENCH (4:4:0) Grammar, reading, composition, oral and aural exercises. Prerequisite: FR 002.
140. FRENCH NOVEL IN ENGLISH TRANSLATION (1-6) Readings of selected French masterpieces in translation; discussion of recurring themes in several literary periods.

GEOGRAPHY (GEOG)

010. (GN) INTRODUCTION TO PHYSICAL GEOGRAPHY (3:2:2) Survey and synthesis of processes creating geographical patterns of natural resources, with application of basic environmental processes in resource management.
020. (GS) HUMAN GEOGRAPHY: AN INTRODUCTION TO MODERN HUMAN GEOGRAPHY (3:3:0) Spatial perspective on human societies in a modernizing world; regional examples; use of space and environmental resources; elements of geographic planning.
124. (DS) ELEMENTS OF CULTURAL GEOGRAPHY (3:3:0) Locational analysis of changes in non-Western cultures. Problems of plural societies, economic development, population growth, and settlement.

GEOSCIENCES (GEOSC)

- *001. PHYSICAL GEOLOGY (3:2:3) Earth processes and their effects on the materials, structure, and morphology of the earth's crust. Practicum includes field work, study of rocks, minerals, dynamic models, and topographic maps.
- *020. (GN) PLANET EARTH (3:2:2) Nontechnical presentation of earth processes, materials, and landscape. Practicum includes field trips, study of maps, rocks, and dynamic models, introduction to geologic experimentation.
- *021. EARTH HISTORY (3:2:2) Evolution of the earth; changing patterns of mountains, lowlands, and seas; development of living organisms. Practicum includes field trips, studies of geologic maps, geologic problems, fossils.

GERMAN (GER)

- 001. ELEMENTARY GERMAN I (4:3:2) Listening, speaking, reading, writing; introduction to basic structures and vocabulary through dialogs and literary and cultural readings. Students may receive credit for only one of the following: GER 001, 011, or 015. Students who have received high school credit for two or more years of German may not schedule this course for credit without permission of the department.
- 002. ELEMENTARY GERMAN II (4:3:2) Listening, speaking, reading, writing; introduction to basic structures and vocabulary through dialogs and literary and cultural readings. Students may receive credit for only one of the following: GER 002, 012, or 016. Students who have received high school credit for four years of German may not schedule this course for credit without permission of the department. Prerequisite: GER 001.
- 003. INTERMEDIATE GERMAN (4:3:2) Continued skill development; readings consisting of short literary and journalistic writings; increased attention to German cultural context. Students may receive credit for only one of the following: GER 003, 012, or 016. Prerequisite: GER 002.
- 011. INTENSIVE BASIC GERMAN (6:5:2) Listening, speaking, reading, writing basic structures and vocabulary of German. Taught on an accelerated basis. Students may receive credit for only one of the following: GER 001, 011, or 015.
- 012. INTENSIVE INTERMEDIATE GERMAN (6:5:2) Continued skill development of structures and vocabulary; listening, speaking, reading, writing. Taught on an accelerated basis. Students may receive credit for only one of the following: GER 002, 003, 012, or 016. Prerequisite: GER 011.
- 015. READING GERMAN I (3:3:0) Survey of German grammar, with readings in technical prose, for students whose programs permit only two semesters of foreign language. Students may receive credit for only one of the following: GER 001, 011, or 015.
- 016. READING GERMAN II (3:3:0) Continuation of GER 015, with readings in the student's own field. Students may receive credit for only one of the following: GER 002, 012, or 016. Prerequisite: GER 015.
- 100. (GH) GERMAN CULTURE AND CIVILIZATION (3:3:0) Life of the German people from the early Middle Ages to modern times; their literature and arts, music, science, and philosophy. Conducted in English.

HEALTH EDUCATION (HL ED)

- 013. (GHS) STANDARD FIRST AID, PERSONAL SAFETY, AND CPR (1:1:1) Theoretical and technical aspects of standard first aid, personal safety, and cardiopulmonary resuscitation (CPR).

*This course includes from one to several field trips for which an additional charge will be made to cover transportation.

HEALTH PLANNING AND ADMINISTRATION

019. (GHS) HEALTH AND DISEASE (1:1:0) Essentials of communicable and chronic disease control.
045. (GHS) ALCOHOL AWARENESS EDUCATION (1:1:0) A course designed to raise awareness relative to the use and abuse of beverage alcohol.
046. (GHS) INTRODUCTION TO HEALTH ASPECTS OF HUMAN SEXUALITY (1:1:0) An examination of health concerns related to sexuality and sexual behavior.
048. (GHS) VALUES AND HEALTH BEHAVIOR (1:1:0) An exploration of opinions, beliefs, attitudes, and personal values as they relate to decision making and health behavior.
057. (GHS) CONSUMER HEALTH (1:1:0) Essentials for determining credibility of claims for particular health services and products from a consumer's perspective.
303. (GHS) EMERGENCY CARE (3:2:2) Competencies leading toward certification in Advanced First Aid and Emergency Care and Cardiopulmonary Resuscitation.
384. APPLIED KINESIOLOGY (3:2:2) Study of anatomical structure, body movement. Characteristic muscle action and motion will be analyzed in relation to physical therapy context. Prerequisite: BIOL 029.
800. PHYSICAL THERAPIST ASSISTANT — INTRODUCTION (3:2:2) Orientation to the field of physical therapy, historical background of the profession, professional ethics, medical terminology, and patient transportation techniques.
801. PHYSICAL THERAPIST ASSISTANT — PROCEDURES (4:2:4) General considerations for physical therapy modalities; development of skills and their application; diagnostic testing. Prerequisite: HL ED 800.
802. CLINICAL NEUROSCIENCE (1:1:0) Anatomical and pathological basis of common conditions involving the nervous system, with emphasis on treatment and management techniques. Prerequisites: BIOL 029, HL ED 803.
803. MEDICAL SURGICAL ORIENTATION TO THERAPY (3:3:0) Introduction to medical and post-operative conditions and/or disease states most frequently treated by physical therapy modalities. Prerequisites: BIOL 029, 041, 042.
804. THERAPEUTIC EXERCISE (3:2:2) Introduction to the principles of exercise in the treatment of disease and injury.
805. REHABILITATION (2:2:0) Examination of techniques and practical experience with appliances used in the rehabilitation of the physically disabled.
806. PHYSICAL THERAPIST ASSISTANT — PRACTICUM (10) The practice of physical therapist assistant skills in a clinical setting under the direct supervision of a registered physical therapist. Prerequisites: HL ED 804, 805.
807. TECHNIQUES FOR EFFECTIVE PATIENT INTERACTION (1:1:0) Techniques of interacting with the sick or disabled patient; emphasis will be on enhancing interaction skills. Prerequisite: PSY 002.
808. CLINICAL ORTHOPEDICS (1:1:0) Anatomical and pathological basis of common musculoskeletal conditions, with emphasis on current treatment techniques. Prerequisites: BIOL 029, HL ED 803.

HEALTH PLANNING AND ADMINISTRATION (H P A)

101. INTRODUCTION TO HEALTH SERVICES ORGANIZATION (3:3:0) Examination of social, political, economic, historic, and scientific factors in the development and organization of the medical care health services.

HISTORY (HIST)

001. (GH) THE WESTERN HERITAGE I (3:3:0) A survey of the Western heritage from the ancient Mediterranean world to the dawn of modern Europe.
002. (GH) THE WESTERN HERITAGE II (3:3:0) A survey of the Western heritage from the dawn of modern Europe in the seventeenth century to the present.

010. (GH) NON-WESTERN CIVILIZATIONS (3:3:0) Introduction to social, economic, and political evolution of non-Western cultures; responses to the West; modernization and development.
012. (DH) HISTORY OF PENNSYLVANIA (3:3:0) Chronological and topical survey, emphasizing immigration of diverse ethnic groups and religious, political, economic, and social developments, including industrialization and urbanization.
020. (DH) AMERICAN CIVILIZATION TO 1877 (3:3:0) An historical survey of the American experience from its colonial beginnings through the Civil War and Reconstruction.
021. (DH) AMERICAN CIVILIZATION SINCE 1877 (3:3:0) An historical survey of the American experience from the emergence of urban-industrial society in the late nineteenth century to the present.
100. (DH) ANCIENT GREECE (3:3:0) Greek world from the earliest Aegean cultures to the death of Alexander the Great and the beginnings of Hellenistic civilization.
101. (DH) THE ROMAN REPUBLIC AND EMPIRE (3:3:0) History of the Roman Republic and Empire from the origins of Rome to the disintegration of the Empire.
107. (DH) [MEDVL 107 (DH)] MEDIEVAL EUROPE (3:3:0) Rise and development of the civilization of medieval Europe from the decline of Rome to 1500.
120. (DS) EUROPE SINCE 1848 (3:3:0) Political, social, and ideological developments; origin and impact of two World Wars; totalitarianism and democracy; changing role in the world.
141. (DH) MEDIEVAL AND MODERN RUSSIA (3:3:0) Introductory survey, including political, social, economic, and cultural development of Kievan, Muscovite, and Imperial Russia.
142. (DS) HISTORY OF COMMUNISM (3:3:0) Marxism; Leninism and evolution of the Soviet Union; formation and development of the Communist bloc; impact of Chinese Communism.
143. (DH) HISTORY OF FASCISM AND NAZISM (3:3:0) The study of right-wing totalitarianism in the twentieth century, with special emphasis on Fascist Italy and Nazi Germany.
144. THE WORLD AT WAR: 1939-1945 (3:3:0) In-depth study of the origins and conduct of World War II. Political and economic aspects as well as military.
150. COLONIAL PENNSYLVANIA (3:3:0) Development of the colony of Pennsylvania through the war for American independence, covering immigration, economics, politics, religion, and society.
151. (DS) TECHNOLOGY AND SOCIETY IN AMERICAN HISTORY (3:3:0) Development of technology in America from colonial times; its reception and its influence on social, economic, and political life.
152. (DH) THE AFRO-AMERICAN EXPERIENCE (3:3:0) African roots; colonial and revolutionary experiences; slavery and abolitionism; civil war and reconstruction; accommodation and protest; the new militancy.
154. HISTORY OF WELFARE IN AMERICA (3:3:0) History of the care of dependent people (including children, the aged, mentally ill, unemployed) from colonial times to the present.
155. (DS) AMERICAN BUSINESS HISTORY (3:3:0) The development of business from the planting of the colonies, through the stages of industrialization, to the present.
156. (L I R 156) HISTORY OF THE AMERICAN WORKER (3:3:0) A study of the American worker from the preindustrial era to the present.
158. HISTORY OF AMERICAN IMMIGRATION (3:3:0) The waves of migration to America and an analysis of the resulting minority groups, their reception, assimilation, and persisting identity.
173. VIETNAM AT WAR (3:3:0) Rise of nationalism and communism: origins of conflict; United States involvement; impact on postwar regional and international politics; contemporary Vietnam.
174. THE HISTORY OF TRADITIONAL EAST ASIA (3:3:0) Comparative cultural, institutional, and social history of traditional China and Japan to their contact with the industrialized West.
175. THE HISTORY OF MODERN EAST ASIA (3:3:0) Comparative survey of the internal developments and external relations of China and Japan since their contact with the industrialized West.
178. (DH) LATIN-AMERICAN HISTORY TO 1820 (3:3:0) Conquest of the New World, development of colonial institutions, impact on native cultures, and origins of independence movements.

HOTEL AND FOOD SERVICE

179. (DH) LATIN-AMERICAN HISTORY SINCE 1820 (3:3:0) Origin, political growth, international relations, and economic status of the Latin-American republics, with emphasis upon present-day conditions.
181. (DH) INTRODUCTION TO THE MIDDLE EAST (3:2:2) Origins of Islamic civilization; expansion of Islam; the Ottoman Empire; the Middle East since 1918.
191. EMERGING AFRICA (3:3:0) Indigenous African societies; impact of Rome, Islam, and Europe; slave trade; colonialism; nationalism; problems since independence.
195. HISTORY OF CANADA (3:3:0) An integrated survey from French colonial beginnings to modern Dominion status, with special emphasis on relations with the United States.

HOTEL AND FOOD SERVICE (H F S)

802. SANITATION PRACTICES IN FOOD SERVICE OPERATIONS (3:3:0) Practical applications related to the management of the sanitation subsystem within a food service operation.
804. HOTEL AND FOOD SERVICE MERCHANDISING (3:3:0) Merchandising as a system distributing benefits, collecting costs, concerned with motivating consumers. Topics include promotion, menu planning, and research methods.

HOTEL, RESTAURANT, AND INSTITUTIONAL MANAGEMENT (HR&IM)

201. INTRODUCTION TO MANAGEMENT IN THE HOSPITALITY INDUSTRY (2:2:0) Exploration and analysis of management opportunities, functions, methods, and concepts in various segments of the hospitality industry. Concurrent: HR&IM 202.
295. ANALYSIS OF FIELD EXPERIENCE I (2:2:0) Directed written and oral analysis of the 500-hour hospitality working experience focusing on the physical and social environment.
301. INTRODUCTION TO THE MANAGEMENT OF SERVICES OPERATIONS (3:3:0) An introduction to management principles and concepts used in service operations. For non-HR&IM majors; HR&IM majors will receive no credit.
310. FOOD AND BEVERAGE PURCHASING AND SANITATION (3:3:0) Food and beverage purchasing and sanitation principles for hospitality operations.
320. PROPERTY AND PHYSICAL PLANT MANAGEMENT (3:3:0) Analysis and management of engineering and maintenance systems, including mechanical, electrical, building, environmental, and energy management. Prerequisite: HR&IM 201.
337. FOOD, BEVERAGE, AND LABOR COST CONTROL (3:3:0) Techniques for analyzing and controlling food, beverage, and labor costs in hospitality organizations. Prerequisite: 3 credits in accounting.
380. LODGING SYSTEMS MANAGEMENT I (3:3:0) Systems analysis, design, and application for hotel functions, including guest services, reservations, reception, telecommunications, guest-city ledger, and the night audit. Prerequisites: HR&IM 201, ACCTG 101.
381. LODGING SYSTEMS MANAGEMENT II (3:3:0) Systems analysis, design, and application for security, housekeeping, and laundry operations management, with additional emphasis on physical design. Prerequisite: HR&IM 380.
850. QUANTITY FOOD PRODUCTION ANALYSIS (4) Physical characteristics of principal food product groups considered. Topics include purchasing problems, preparation techniques, quality and cost control.
860. HOSPITALITY SUPERVISION SEMINAR (4) Hospitality management topics are discussed with a major emphasis on operations management. Prerequisites: H F S 804, HR&IM 301, 310, 381.
870. HOSPITALITY ADMINISTRATION SEMINAR (4) Components of food service systems are identified and studied as separate problems and as a total system. Prerequisite: HR&IM 860.

HUMAN DEVELOPMENT (H DEV)

- 100. INTRODUCTION TO HUMAN DEVELOPMENT (1:1:0) Human development as a process of man-environment transactions, and the relationships of various fields to the study of that process.
- 101. HUMAN GROWTH AND DEVELOPMENT (3:3:0) Factors affecting human development, health, and behavior over the life span: biological, environmental, psychosocial, community, and historical.
- 102. POLICY AND PLANNING FOR HUMAN DEVELOPMENT (3:3:0) Multidisciplinary analysis of concepts and practice in the creation and administration of social interventions for human development.
- 200. EMPIRICAL INQUIRY IN HUMAN DEVELOPMENT (3:2:2) Introduction to methods and philosophy of empirical inquiry applied to problems of human development.
- 395. FIELD PROJECTS (1-12) Independent study and research in a human service program; written and oral summary of rationale, procedures, findings.

HUMANITIES (HUMAN)

- 001. (GH) VALUES OF THE WESTERN CULTURAL HERITAGE (3:3:0) Fundamental values of human experience as expressed in outstanding philosophical and literary works.
- 002. (GH) SHAPING OF THE MODERN MIND (3:3:0) Relevance to the present age of influential literary and philosophical texts illustrative of the principal epochs of Western civilization.
- 021. (DH) IDEAS AND ARTS (3:3:0) Interaction of intellectual and aesthetic values from the Renaissance to the present.
- 050. (DH) THE LITERATURE AND LORE OF MINING (3:3:0) Experience and values of mining tradition: survey of the literature and lore, including field experience.
- 101. (DH) MODERN SCIENCE AND HUMAN VALUES (3:3:0) Relationships of science to the aspirations, values, and arts of man.
- 102. THE GRAND TOUR: A VISUAL SURVEY OF EUROPEAN HISTORY (3:3:0) An historical interdisciplinary examination of the visual heritage of Italy, France, Germany, Spain, and the British Isles.

INDIVIDUAL AND FAMILY STUDIES (I F S)

- 129. (DS) INTRODUCTION TO INDIVIDUAL AND FAMILY DEVELOPMENT (3:3:0) Introduction to psychosocial and family development at all stages of the individual and family life cycle.
- 216. PERSONAL AND INTERPERSONAL SKILLS (3:3:0) Conceptions of life-span personal and interpersonal skill enhancement.
- 218. FOUNDATIONS OF MARRIAGE (3:3:0) Factors influencing the husband/wife relationship across the life course.
- 219. FAMILY FINANCIAL MANAGEMENT (3:3:0) How families plan their finances and factors that determine their decisions.
- 229. (DS) INFANT AND CHILD DEVELOPMENT (3:3:0) Social, behavioral, and biological development and intervention during infancy and childhood.
- 239. (DS) ADOLESCENT DEVELOPMENT (3:3:0) Social, behavioral, and biological development and intervention throughout adolescence.
- 249. (DS) ADULT DEVELOPMENT AND AGING (3:3:0) Physiological, psychological, and social development and intervention from young adulthood through old age.
- 297. SPECIAL TOPICS (1-9)
- 311. INDIVIDUAL AND FAMILY INTERVENTIONS (3:3:0) Survey of individual and family formal and informal intervention efforts; historical and current perspectives and approaches. Prerequisites: I F S 129; 3 credits in social, behavioral, or biological sciences.

INDUSTRIAL ENGINEERING

315. FAMILY DEVELOPMENT (3:3:0) Family functions over the life course: family from a multidisciplinary perspective, emphasizing adaptation and change. Prerequisites: I F S 129; 3 credits in social, behavioral, or human biological sciences.
327. HUMAN DEVELOPMENT ACROSS THE LIFE SPAN (3:3:0) A review of research and theory on human development across the life span from a multidisciplinary perspective. Prerequisites: I F S 129; 3 credits in social, behavioral, or human biological sciences.
330. OBSERVATION OR EXPERIENCE WITH PRESCHOOL CHILDREN (1-4) Directed observations of, or supervised experience with, preschool children in group or home settings. Prerequisite: I F S 327 or PSY 213.

INDUSTRIAL ENGINEERING (I E)

315. INDUSTRIAL ORGANIZATION AND ADMINISTRATION (3:3:0) Fundamental principles of organization leading to intelligent appreciation of the simpler problems of factory organization and operation. Students registered in Industrial Engineering may not schedule this course.

INDUSTRIAL ENGINEERING TECHNOLOGY (IE T)

805. ECONOMICS OF INDUSTRY (2:2:0) Internal economics of industrial enterprise, cost factors, and methods of comparing alternate proposals.
809. INSPECTION AND QUALITY CONTROL (3:2:2) Inspection methods and procedures and their applications to control and acceptance sampling based on statistical methods. Prerequisite: MATH 087.
811. MANUFACTURING MATERIALS AND PROCESSES (3:2:3) Mechanical properties of materials; primary processing methods used in manufacturing, emphasizing ferrous metals, their relationship to other metals and nonmetals.
812. MANUFACTURING PROCESSES (3:1:6) Technology related to metal removal, dimensional inspection, metal joining, hot and cold forming heat treating, metal casting, properties of materials. Prerequisite: IE T 811.
815. PRODUCTION DESIGN (3:1:4) The planning, designing, and specifying of both standard and special tools required for the production of manufactured goods. Prerequisites: E G 803, IE T 812.
830. SELECTED TOPICS IN INDUSTRIAL ENGINEERING TECHNOLOGY (3) Individual or group work in industrial engineering technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.

INSURANCE (INS)

102. PERSONAL INSURANCE PLANNING (3:3:0) Introduction to the principles and practices of personal insurance planning. May not be scheduled by College of Business Administration students. Prerequisite: third-semester standing.
301. RISK AND INSURANCE (3:3:0) Introduction to the principles and methods of handling business and personal risks; emphasis on insurance techniques. Prerequisite: fourth-semester standing.
800. INSURANCE PRINCIPLES (3:3:0) Introductory survey of all lines of insurance for handling business and personal risks.
810. LIFE INSURANCE (3:3:0) The life insurance contracts as methods of treating the problems of premature death and superannuation. Prerequisite: INS 800.
820. PROPERTY AND CASUALTY INSURANCE (3:3:0) Fundamental principles of property and casualty insurance. Prerequisite: INS 800.
830. INSURANCE PRACTICUM (3:3:0) Practical introduction to insurer operations in company and agency offices. Prerequisite: INS 820.

INTERNATIONAL BUSINESS (I B)

862. INTERNATIONAL BUSINESS (3:3:0)

INTERNATIONAL UNDERSTANDING (INT U)

200. INTERNATIONAL UNDERSTANDING AND WORLD AFFAIRS (3:3:0) Interdisciplinary consideration of international problems, conflict and accommodation; impact of various cultures and ideologies on world affairs and foreign policy. Credit will not be given for both this course and PL SC 014. Prerequisite: third-semester standing.

LABOR AND INDUSTRIAL RELATIONS (L I R)

100. (DS) INDUSTRIAL RELATIONS (3:3:0) Introductory analysis of the employment relationship and of the interrelated interests of managements, workers, unions, and the public.

102. THEORIES AND FUNCTIONS OF LABOR ORGANIZATIONS (3:3:0) Study of the theory and practice of labor organizations: goals, internal structure and operations, and impact on society.

103. LABOR LAW (3:3:0) A study of legislation affecting labor organizations and their members.

104. (DS) THE PRACTICE OF COLLECTIVE BARGAINING (3:3:0) Study of the factors involved in negotiating labor contracts, the issues, processes, bargaining relationships, and public responsibilities facing the parties.

156. (HIST 156) HISTORY OF THE AMERICAN WORKER (3:3:0) A study of the American worker from the preindustrial era to the present.

296. INDEPENDENT STUDIES (1-18)

LIBRARY STUDIES (L ST)

110. INFORMATION ORGANIZATION AND RETRIEVAL (3:2:2) Information structure and resources related to search and problem-solving procedures to identify, organize, and locate print and nonprint materials. Prerequisite: ENGL 015 or 030.

MANAGEMENT (MGMT)

100. SURVEY OF MANAGEMENT (3:3:0) Introduction to organizational factors relevant to management processes, including leadership, motivation, job design, technology, organizational design and environments, systems, change. For non-Business students only.

802. SUPERVISORY MANAGEMENT (3:3:0) Preparation for supervisory positions in formal organizations. Emphasis placed on the motivational aspects of the supervisor's job. Prerequisite: MGMT 100.

MANAGEMENT INFORMATION SYSTEMS (M I S)

100. INTRODUCTION TO MANAGEMENT INFORMATION SYSTEMS (3:3:0) Business computer systems and their impact on management decision making. A student cannot receive credit toward graduation for both M I S 100 and M I S 431.

101. MICROCOMPUTER PROGRAMMING IN STRUCTURED BASIC (3:3:0) Introduction to the microcomputer algorithmic process using BASIC as the vehicle to construct computer solutions to common problems.

103. MICROCOMPUTER APPLICATIONS IN BUSINESS (3:3:0) Introduction to current business uses of the microcomputer, including spreadsheets, database management, word processing, and decision-making models.

MARKETING

106. SPECIALIZED MICROCOMPUTER APPLICATIONS IN BUSINESS (1-6) Use of the microcomputer in the functional areas of business (e.g., accounting, management, marketing, finance, etc.). Prerequisites: 3 credits in a business administration appropriate functional area; prior written approval of department.

110. INTRODUCTION TO COBOL (3:3:0) Fundamentals of structured COBOL programming. Prerequisite: M I S 100.

111. ADVANCED COBOL (3:3:0) Advanced structured COBOL programming. Prerequisite: M I S 110.

MARKETING (MKTG)

220. PERSONAL SELLING (3:3:0) Principles underlying the sales process and practical application of these principles to selling situations. Studies role of selling in total marketing process. Prerequisite: third-semester standing.

221. CONTEMPORARY AMERICAN MARKETING (3:3:0) Social and economic aspects; movement of goods and services from producers to consumers; analysis of marketing functions, systems, and institutions. A student may not receive credit toward graduation for both MKTG 221 and 301. Prerequisite: 3 credits in economics.

801. PRINCIPLES OF MARKETING (3:3:0) Prerequisite: MKTG 221.

802. PROMOTION MANAGEMENT (3:3:0) The application and management of various forms of persuasive communication with potential customers: personal selling, sales management, advertising, sales promotion. Prerequisite: MKTG 801.

803. PRINCIPLES OF RETAILING (3:3:0) Introduction to the management of retailing organizations, with emphasis on decision making. Not open to retailing majors.

804. PRINCIPLES OF RETAILING SALESMANSHIP (3:3:0) Principles of selling applied to the retail level of trade; practical application of these principles in various sales situations.

805. RETAILING I (3:3:0) An analysis of the management and merchandising policies of various types of retailing institutions.

806. RETAILING II (3:3:0) Merchandising, promotion, and control policies of retail store management. Prerequisite: MKTG 805.

807. INTRODUCTION TO MARKETING RESEARCH (3:3:0) Managerial aspects of marketing research, with emphasis on practical details of operating a small-scale project. Prerequisites: MKTG 221, Q B A 801.

808. PRINCIPLES OF EFFECTIVE PURCHASING (3:3:0) Introduction to the purchasing function in organizations, with emphasis on integration of purchasing activity with other aspects of marketing management. Prerequisite: MKTG 221.

809. PRODUCT PLANNING AND DEVELOPMENT (3:3:0) Problems faced by the product or branch manager including those of planning, research, and consumer satisfaction. Prerequisite: MKTG 221.

810. PRINCIPLES OF INDUSTRIAL MARKETING (3:3:0) Introduction to the management of industrial marketing strategy. Emphasizes strategic response to industrial marketing opportunities and response to competition. Prerequisite: MKTG 221.

MATHEMATICS (MATH)

004. INTERMEDIATE ALGEBRA (3:3:0) Polynomials, fractions, exponents, radicals, first- and second-degree equations and inequalities, sequences, systems of equations. Limited to students indicating deficiencies on the mathematics (algebra) proficiency examination. *This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program.*

005. COLLEGE ALGEBRA I (3:3:0) Polynomial and rational expressions; exponents and radicals; equations and inequalities; functions, relations, and their graphs; exponential and logarithmic functions. Prerequisite: MATH 004 or satisfactory performance on the mathematics (algebra) proficiency examination.

006. PLANE TRIGONOMETRY (3:3:0) Trigonometric functions; solutions of triangles; trigonometric equations; identities. Prerequisites: MATH 005 or satisfactory performance on the mathematics (algebra) proficiency examination; 1 unit of geometry.
017. (GQ) FINITE MATHEMATICS (3:3:0) Introduction to logic, sets, probability. Prerequisite: 2 units of high school mathematics.
018. (GQ) ELEMENTARY LINEAR ALGEBRA (3:3:0) Matrices and vectors; transformations; systems of linear equations; convex sets and linear programming. Prerequisite: 2 units of high school mathematics.
035. (GQ) GENERAL VIEW OF MATHEMATICS (3:3:0) Survey of mathematical thought in logic, geometry, combinatorics, and chance.
036. (GQ) INSIGHTS INTO MATHEMATICS (3:3:0) Examples of mathematical thought in number theory, topology, theory of symmetry, and chance. Prerequisite: 1 unit of algebra or MATH 004.
087. TECHNICAL MATHEMATICS (5:5:0) Algebraic expressions, exponents, radicals, equations, graphs, systems of equations, trigonometric functions, solution of right triangles, vectors, complex numbers. Prerequisite: MATH 004 or satisfactory performance on the mathematics proficiency examination.
088. TECHNICAL MATHEMATICS AND CALCULUS (5:5:0) Logarithm, inverse trigonometric functions, trigonometric identities, inequalities, series, limits, differentiation, higher order derivatives, implicit differentiation, applications, integration, areas, volumes, differential equations. Prerequisite: MATH 087.
110. (GQ) TECHNIQUES OF CALCULUS I (4:4:0) Functions, graphs, derivatives, integrals, techniques of differentiation and integration, exponentials, improper integrals, applications. Students may take only one course for credit from MATH 110, 140, and 140A. Prerequisite: MATH 005 or satisfactory performance on the mathematics (algebra) proficiency examination.
111. TECHNIQUES OF CALCULUS II (2:2:0) Analytic geometry, partial differentiation, maxima and minima, differential equations. Prerequisite: MATH 110.
140. (GQ) CALCULUS WITH ANALYTIC GEOMETRY I (4:4:0) Functions; limits; analytic geometry; derivatives, differentials, applications; integrals, applications. Students may take only one course for credit from MATH 110, 140, and 140A. Prerequisites: MATH 006, 007; or MATH 040; or MATH 041; or satisfactory performance on the mathematics (both algebra and trigonometry) proficiency examination.
141. (GQ) CALCULUS WITH ANALYTIC GEOMETRY II (4:4:0) Derivatives, integrals, applications; sequences and series; analytic geometry; polar coordinates; partial derivatives. Prerequisite: MATH 140 or 140A.
220. MATRICES (2:2:0) Systems of linear equations; matrix algebra; eigenvalues and eigenvectors; linear systems of differential equations. Prerequisite: MATH 110 or 140.
230. CALCULUS AND VECTOR ANALYSIS (4:4:0) Three-dimensional analytic geometry; vectors in space; partial differentiation; double and triple integrals; integral vector calculus. Students who have passed either MATH 231 or 232 may not schedule MATH 230 for credit. Prerequisite: MATH 141.
231. CALCULUS OF SEVERAL VARIABLES (2:2:0) Analytic geometry in space; differential and integral calculus of several variables. Students who have passed MATH 230 may not schedule this course. Prerequisite: MATH 141.
232. INTEGRAL VECTOR CALCULUS (2:2:0) Multidimensional analytic geometry; potential fields; flux; Green's divergence and Stokes's theorem. Students who have passed MATH 230 may not schedule this course. Prerequisite: MATH 231.
250. ORDINARY DIFFERENTIAL EQUATIONS (3:3:0) First- and second-order equations; special functions; Laplace transform solutions; higher order equations. Prerequisite: MATH 141.
251. ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS (4:4:0) First- and second-order equations; special functions; Laplace transform solutions; higher order equations; Fourier series; partial differential equations. Prerequisite: MATH 141.
800. BUSINESS MATHEMATICS (3:3:0) Operations with whole numbers, fractions and mixed numbers, decimals and percent, formulas and equations, percentages and interest, introduction to algebra.

MECHANICAL ENGINEERING TECHNOLOGY (ME T)

800. MECHANISMS (2:0:4) Motion in machine elements; strength and properties of materials; design of machine elements. Prerequisite: E MCH 811.
805. KINEMATICS (3:2:3) Graphical and analytical studies of relative motions, instant centers, velocity and acceleration in plane motions, slider crank mechanisms, cams, gears, gear trains, and flexible connectors. Prerequisites: E G 001, E MCH 811.
807. HEAT TRANSFER (3:3:0) Basic principles of conduction, convection, and radiation, emphasizing practical applications.
810. PRODUCT DESIGN (3:2:3) Design of machine elements including levers, bearings, shafts, clutches, springs, and gears; selection of ball bearings and belts; design of small mechanical devices. Prerequisites: E MCH 813, ME T 805.
830. SELECTED TOPICS IN MECHANICAL ENGINEERING TECHNOLOGY (3) Individual or group work in mechanical engineering technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.
881. ELEMENTARY THERMO AND FLUID DYNAMICS (4:4:0) Basic problems in compressible fluid flow. Laws of dynamics and thermodynamics, mechanical properties of fluids, elementary heat transfer. Prerequisite or concurrent: MATH 088, PHYS 150.
882. AIR RESOURCE MANAGEMENT (2:2:0) Introduction to air pollution. Pollutants, sources, effects, air monitoring systems, air quality criteria and standards, governmental control programs and procedures.
884. SAMPLING AND MONITORING PROGRAM (2:0:4) Instrumentation and site selection, field data acquisition for major air pollutants, data analysis and evaluation.

METALLURGICAL ENGINEERING TECHNOLOGY (MET E)

800. METALLURGICAL LABORATORY PRACTICE (4:2:4) Instruction and practice in various metallurgical techniques. Prerequisite: CHEM 011. Prerequisite or concurrent: PHYS 150.
801. PRINCIPLES OF EXTRACTIVE METALLURGY (2:2:0) An introduction to several metals' extraction processes using a problem-solving approach. Prerequisite: CHEM 012.
802. PHYSICAL METALLURGY (3:2:2) Structures of metals and alloys; structure manipulations; structure-property relationships. Prerequisites: CHEM 012, PHYS 150, MATH 087, MET E 800.
803. MATERIALS TESTING (3:1:4) Applications of testing procedures to determine properties of inorganic materials.
804. FERROUS METALLURGY (3:2:2) Making, shaping, and heat treatment of cast irons and steels. Prerequisites: CHEM 012, MET E 800.
805. NONFERROUS METALLURGY (3:2:2) Extraction of nonferrous metals from their ores and subsequent compositional adjustment by refining and alloying. Prerequisites: CHEM 012, MET E 800.
806. SUMMER FIELD PRACTICE (3) Practical experience in the metallurgical industries.
807. METALLURGICAL OPERATIONS (1:0:3) Plant trips to metals industries; classroom discussion with metallurgists concerning their work and the role of the metallurgical associate.

METEOROLOGY (METEO)

003. (GN) INTRODUCTORY METEOROLOGY (3:2:2) Nontechnical treatment of fundamentals of modern meteorology; effect of weather and climate on man and his activities. A student who took METEO 002 may take the laboratory part of this course for 1 credit only.

MICROBIOLOGY (MICRB)

106. (GN) **ELEMENTARY MICROBIOLOGY (2:2:0)** Importance of microorganisms in public health and disease, agriculture, and industry; descriptive course for nontechnical students.

107. (GN) **ELEMENTARY MICROBIOLOGY LABORATORY (1:0:3)** Selected techniques with regard to recognition and enumeration of bacteria; effects of chemical and physical agents on microorganisms. Prerequisite or concurrent: MICRB 106.

150. **INTRODUCTORY MEDICAL LABORATORY TECHNOLOGY (4:2:10)** Introduction to basic principles and procedures of clinical laboratory work. Practicum emphasizes proper collection, handling, and preparation of biological samples. Prerequisite: admission to 2-MLT program.

151. **SEMINAR AND PRACTICUM FOR MEDICAL LABORATORY TECHNICIANS (2-17 per semester, maximum of 28)** Lectures and laboratory sessions introduce methods and procedures, underlying principles, and their applications in clinical practice. Prerequisites: MICRB 150, 201, 202, CHEM 034, BIOL 041.

Unit A. Clinical Chemistry (9) Basic principles and procedures for measuring chemical components of blood and other body fluids.

Unit B. Clinical Microbiology/Serology (6) Properties and identification of normal and abnormal microbial flora. Antigen-antibody interactions of diagnostic importance.

Unit C. Hematology (6) Red and white blood cell identification and enumeration. Related procedures for diagnosing normal or disease states.

Unit D. Immunohematology (5) Immunologic considerations necessary for the transfusion of blood and blood products.

Unit E. Urinalysis (2) Identification of cellular and crystalline urinary sediments. Qualitative chemical analysis of urine.

201. **INTRODUCTORY MICROBIOLOGY (3:3:0)** Elementary principles of microbial and viral interrelationships, morphology, and physiology; relation to food, water, soil, industry, and disease processes. Prerequisite: BIOL 101.

202. **INTRODUCTORY MICROBIOLOGY LABORATORY (2:0:4)** Qualitative and quantitative techniques with regard to recognition of bacteria and their processes on a microscopic, colonial, and physiological basis. Prerequisite: CHEM 012. Prerequisite or concurrent: MICRB 201.

MICROCOMPUTER PROCESSING (MCMP)

840. **MICROPROCESSOR INTERFACING (5:4:2)** Examination of the devices used in microprocessor systems to communicate with external digital and analog systems. Prerequisite: EE T 810. Concurrent: EE T 811.

841. **ADVANCED MICROPROCESSOR SYSTEMS (4:3:2)** Development of an understanding of microprocessor principles and systems through a study of current 8- and 16-bit microprocessors. Prerequisite: EE T 811.

842. **MICROPROCESSOR SYSTEMS DESIGN AND ANALYSIS (3:1:4)** Experience in designing, constructing, and testing a complete microcomputer system and its practical application to control. Prerequisite: EE T 811.

MINERAL PROCESSING (MN PR)

061. **INTRODUCTION TO COAL PREPARATION (3:3:0)** Theory and application of modern coal preparation practice. Sampling, crushing, sizing, gravity concentration, flotation, dewatering, drying; pollution control; flowsheets.

MINING (MNG)

023. MINERAL LAND AND MINE SURVEYING (3:0:9) Surveying theory and practice applied to mineral lands and mines; traversing, leveling, mapping, shaft plumbing; stope, room, and development surveying. Prerequisites: E G 011, 1/2 unit of secondary school trigonometry.

030. INTRODUCTION TO MINING ENGINEERING (3:2:3) Examination, development, and exploitation of mineral deposits in case studies of mineral deposits and mines; unit operations, cycling, equipment, methods.

MINING TECHNOLOGY (MNG T)

800. MINING TECHNOLOGY ORIENTATION (1:0:2) Films, slides, and lectures to acquaint the student with the coal mining industry and its impact on society.

801. COAL MINING TECHNOLOGY (3:2:3) Analysis of coal mining systems; integration of unit operations and mining methods for efficient mine production.

802. MINE VENTILATION (3:2:3) Quality and quantity analysis and control of mine atmosphere. Prerequisite or concurrent: CHEM 011, PHYS 150, MNG T 801.

803. STRATA CONTROL (3:2:3) Fundamentals of stresses and strains in rocks; virgin and concentrated stresses; roof support, subsidence, bursts, and stability control. Prerequisite: E MCH 811. Prerequisite or concurrent: MNG T 801.

804. MINE PLANT TECHNOLOGY (3:2:3) Electrical systems in mines; mechanical power applications and materials handling systems. Prerequisite: PHYS 150.

805. MINE SYSTEMS TECHNOLOGY (3:2:3) Quantitative methods of work measurement and their application to production and method study problems related to mines. Prerequisite: MNG T 801.

806. MINE MANAGEMENT AND LAW (3:3:0) The problems of the individual in coal mine management in relation to environment, employer, union, and law.

807. ELECTRICAL MINE MACHINE CIRCUITS (3:2:3) Topics of electrical power fundamentals, power and control circuits, motors and their mine applications will be covered. Prerequisite: MNG T 804.

808. MINE POWER DISTRIBUTION (3:2:3) Topics of high voltage circuits, underground transmission, power stations, power conversion, safety regulations, and power devices will be covered. Prerequisite: MNG T 804.

809. MINE MACHINERY HYDRAULICS (3:2:3) Topics of basic hydraulic principles and their application to mining and mine machinery will be covered. Prerequisites: MATH 087, PHYS 150.

810. MINE MACHINE DYNAMICS (3:2:3) Topics on basic machines and their application to the principles of mine machine operation will be covered. Prerequisites: E MCH 811, PHYS 150.

811. PRACTICUM IN MINE MAINTENANCE (3:0:9) Field and shop techniques in procedures of electrical, mechanical, and hydraulic phases of mine maintenance will be covered. Prerequisites: MNG T 804, PHYS 150.

815. SURFACE MINING TECHNOLOGY (3:2:3) Analysis of surface mining systems; integration of unit operations and equipment utilization for efficient operation. Prerequisite: MNG T 800.

816. ELEMENTS OF SURFACE MINE DESIGN (3:2:3) Exploration methods, pit planning, and design; drilling and fragmentation; loading and haulage systems; and slope stability. Prerequisite: MNG T 815.

817. SURFACE MINING PRODUCTION TECHNOLOGY (3:2:3) Application of time study and work measurement to surface production. Efficiency of equipment usage and equipment utilization scheduling. Prerequisite: MNG T 815.

818. SURFACE MINING HYDROLOGY (3:3:0) Water control and treatment; hydrologic studies before and after mining; impoundments and water treatment. Prerequisites: CHEM 011; GEOSC 001 or 020 or 101.

819. RECLAMATION TECHNOLOGY (3:3:0) Spoil-bank reclamation and contour grading; revegetation and reclaimed land utilization.

MUSIC (MUSIC)

005. (GA) THE FUNDAMENTALS OF MUSIC APPRECIATION (3:3:0) Recitation and lectures with recorded examples of melody, harmony, rhythm, vocal and instrumental timbre, form, and program and absolute music.

008. (GA) RUDIMENTS OF MUSIC (3:3:0) Introduction to the elements of music: notation, scales, meter, rhythm, intervals; basic chord structure. For non-Music majors.

NUCLEAR ENGINEERING TECHNOLOGY (NE T)

801. RADIOLOGICAL SAFETY (2:2:0) Discussion of basic radiation dose units, radiation monitoring techniques, biological effects of radiation, and government regulations. Prerequisite or concurrent: NE T 802.

802. ELEMENTS OF NUCLEAR TECHNOLOGY (4:4:0) Atomic and nuclear structure, electromagnetic radiation, nuclear radiations, nuclear interactions, neutron diffusion, and reactor materials. Prerequisites: MATH 088, PHYS 151.

803. ELEMENTS OF NUCLEAR POWER GENERATION (3:3:0) Survey of various reactor types, with emphasis on fuel heat removal and power generation, fuel fabrication and reprocessing. Prerequisites: NE T 802, ME T 807.

804. INTRODUCTION TO REACTOR TECHNOLOGY (3:3:0) Steady state reactor theory, kinetic behavior of reactors, shielding, and reactor control systems. Prerequisite: NE T 802.

805. PRINCIPLES OF MEASUREMENT (3:2:2) A study of measurement in the nuclear industry, including the instruments used, accuracy of measurement, and statistical justification. Prerequisites: EE T 814, PHYS 151.

812. NUCLEAR TECHNOLOGY LABORATORY (3:1:4) Laboratory study of radiation measurements and the diversified application of nuclear techniques. Prerequisites: NE T 801, 805.

814. REACTOR TECHNOLOGY LABORATORY (3:1:4) Laboratory study of basic reactor experiments, control rod calibration, critical experiment, etc. Emphasis placed upon reactor operations. Prerequisites: NE T 801, 805. Concurrent: NE T 804.

820. ELECTRICAL GENERATION ORIENTATION (1:1:0) Introduction and comparison of methods of generating electricity; description of the variety of occupations in the electrical generating industry.

821. INTRODUCTORY BOILING WATER REACTOR TECHNOLOGY (1:1:0) Introduction to the concept of commercial power generation of electricity through the use of a boiling water reactor.

822. POWER PLANT QUALITY ASSURANCE / QUALITY CONTROL (1:1:0) Introduction to concepts of quality assurance/quality control; historical development of standards and regulatory guides; specific applications to nuclear plants.

830. SELECTED TOPICS IN NUCLEAR ENGINEERING TECHNOLOGY (3) Individual or group work in nuclear engineering technology for students with specific occupational objectives. Prerequisite: third-semester standing.

NUTRITION (NUTR)

150. ELEMENTARY NUTRITION (2:2:0) Fundamentals of nutrition and its relation to human health. Students who have passed NUTR 251 may not schedule this course.

251. (GHS) INTRODUCTORY PRINCIPLES OF NUTRITION (3:3:0) The nutrients: food sources and physiological functions as related to human growth and well-being throughout life; current nutrition issues. Students who have passed NUTR 150 may not schedule this course.

252. DIET THERAPY AND NUTRITION CARE IN DISEASE (4:3:2) Principles of nutrition care to meet therapeutic needs, inpatient care, and rehabilitation. Prerequisite: NUTR 251 or 801.

801. NUTRITION COMPONENT OF THE FOOD SERVICE SYSTEM (3:3:0) Introduction to basic nutrition principles and their application in a food service system.

OPERATIONS MANAGEMENT (OPMGT)

801. PRODUCTION AND OPERATIONS MANAGEMENT (3:3:0) Quantitative tools and techniques used in managing the production function of a firm, including inventory control, production scheduling, capacity planning. Prerequisites: MGMT 100, Q B A 801.

PHILOSOPHY (PHIL)

*001. (GH) BASIC PROBLEMS OF PHILOSOPHY (3:3:0) Issues such as the foundations of knowledge, the existence of God, the problem of freedom, and the nature of reality.

003. (GH) MORAL VALUES (3:3:0) Freedom, choice, and obligation in conduct; values and the foundations of ethics.

010. CRITICAL THINKING AND ARGUMENT (3:3:0) Principles of correct thinking; deductive and inductive inference; use and misuse of language in reasoning.

012. (GQ) ELEMENTS OF SYMBOLIC LOGIC (3:3:0) Translating arguments into symbolic form and establishing validity. For nonscience majors.

100. (DH) THE MEANING OF HUMAN EXISTENCE (3:3:0) A study of some philosophical ways of viewing the purpose of life, the good life, and history and its meaning.

102. (DH) EXISTENTIALISM (3:3:0) Exploration of a controversial modern mode of philosophizing about life, death, absurdity, and faith.

103. (DH) ETHICS AND SOCIAL ISSUES (3:3:0) Ethical issues such as war, privacy, crime and punishment, racism and sexism, civil liberties, affirmative action, abortion, and euthanasia.

104. (DH) ETHICS AND THE PROFESSIONS (3:3:0) The philosophical basis for the ethics of professional practice; illustrations include law, business, public administration, journalism, engineering, teaching, medicine.

105. INTRODUCTION TO THE PHILOSOPHY OF LAW (3:3:0) Topics normally include concepts of law and responsibility, justice and punishment, legal ethics, and the limits of law.

106. BUSINESS ETHICS (3:3:0) A study of ethical issues which confront the business community. Designed primarily for majors in the College of Business Administration.

108. (DH) SOCIAL AND POLITICAL PHILOSOPHY (3:3:0) Philosophical analysis of political and communal order; theories of individual and group action within the structures of social obligation.

111. (DH) ORIENTAL PHILOSOPHY (3:3:0) Study of philosophical, aesthetic, and religious ideas in the classics of Eastern thought.

212. (GQ) SYMBOLIC LOGIC (3:3:0) The logic of propositions, relations, and quantification; the nature and properties of formal systems. Intended primarily for science-oriented students.

PHYSICAL EDUCATION (P E)

NOTE: All P E courses satisfy the Health Sciences and Physical Education (GPE) component of General Education.

129. FITNESS FOR LIFE (1:1:2) Effecting change in life-style and enhancing well-being through knowledge, understanding, and commitment to fitness. Students who have received credit for P E 220, Personal Fitness, may not schedule this course.

189. LIFE SAVING—ADVANCED (1:0:3) Course outlined by the American Red Cross; prepares the student for the Advanced Life Saving examination. Prerequisite: passing of qualifying swimming test.

366. WATER SAFETY INSTRUCTOR (1:0:3) The American Red Cross aquatic instructor's course, including swimming, diving, life saving, water safety. Prerequisite: students wishing to take instructor's examination must have a recent Red Cross Advanced Life Saving certificate.

*Students may take only one course for General Education credit from PHIL 001 or 004.

PHYSICAL SCIENCE (PH SC)

007. PHYSICAL SCIENCE (3:3:0) Development of physics, including modern physical concepts and their relationship to the careers of physical scientists. May not be scheduled by students who have received credit for PHYS 100, 201, 215, or 221.

008. PHYSICAL SCIENCE (3:3:0) Selected concepts of chemistry showing their development, interrelationship, and present status. May not be scheduled by students who have received credit for CHEM 011 or 012.

PHYSICIAN'S ASSISTANT (P A)

800. BASIC MEDICAL AND CLINICAL SCIENCES I (7:7:0) Introduction to principles of the basic and clinical sciences related to providing care to patients in a primary-care setting.

801. BASIC MEDICAL AND CLINICAL SCIENCES II (7:7:0) Continuation of P A 800. Principles of the basic and clinical sciences related to providing care to patients in a primary-care setting. Prerequisite: P A 800.

805. MICROBIOLOGY (1:1:0) Introduction to the principles of clinical microbiology useful to a physician's assistant functioning in a primary-care setting.

810. HUMAN BEHAVIOR (3:3:0) Introduction to the principles of psychiatry and behavioral medicine relevant to medical care in the primary-care setting.

820. PATIENT-ORIENTED CARE I (3:2:8) Introduction of a comprehensive approach to care of the patient in the family context.

821. PATIENT-ORIENTED CARE II (3:2:8) Continuation of P A 820. Introduction to patient and family care in the context of health care systems. Prerequisite: P A 820.

840. CLINICAL SKILLS FOR PHYSICIAN'S ASSISTANT I (2:1:4) Technical skills development necessary to prepare the student in the clinical skills areas required during the primary health care practicum.

841. CLINICAL SKILLS FOR PHYSICIAN'S ASSISTANT II (2:1:4) Continuation of P A 840. Technical skills development necessary to prepare the student in the clinical skills areas required during the primary health care practicum. Prerequisite: P A 840.

850. THERAPEUTICS (3:3:0) Introduction to basic applied clinical pharmacology with emphasis on chemical therapeutic agents commonly used with primary-care patients.

870. PEDIATRICS (1:1:0) Introduction to the principles of pediatric primary care.

871. GERIATRICS (1:1:0) Introduction to the unique social, psychological, and medical-surgical problems of the aging patient.

878. CATEGORICAL EXPERIENCES (9:0:40) Clinical rotations in categorical areas appropriate to physician's assistant clinical skills development.

880. PRACTICUM IN PRIMARY HEALTH CARE DELIVERY I (15:0:40) Preceptorship with primary-care physician. Emphasis on health appraisal, evaluation of patient problems, and implementation of care. Prerequisite: P A 878.

881. PRACTICUM IN PRIMARY HEALTH CARE DELIVERY II (15:0:40) Continuation of P A 880. Preceptorship with primary-care physician. Emphasis on health appraisal, evaluation of patient problems, and implementation of care. Prerequisite: P A 880.

PHYSICS (PHYS)

150. TECHNICAL PHYSICS (3:2:2) Elementary treatment of topics in mechanics, heat, wave motion, and sound leading toward an understanding of technical applications. Prerequisite: 1½ units of algebra. Prerequisite or concurrent: MATH 087.

151. TECHNICAL PHYSICS (3:2:2) Elementary treatment of topics in electricity, light, and modern physics leading toward an understanding of technical applications. Prerequisite: PHYS 150.

201. (DN) GENERAL PHYSICS (4:4:0) Mechanics. Concurrent: MATH 140.

POLITICAL SCIENCE

202. (DN) GENERAL PHYSICS (4:3:2) Electricity and magnetism. Prerequisite: PHYS 201. Concurrent: MATH 141.
203. (DN) GENERAL PHYSICS (3:3:0) Wave motion and thermodynamics. Prerequisite: PHYS 202.
204. (DN) GENERAL PHYSICS (4:3:2) Wave motion and thermodynamics, with laboratory. Prerequisite: PHYS 202.
215. (DN) INTRODUCTORY PHYSICS (4:3:2) Selected topics in mechanics, heat, and sound. Prerequisite: algebra to quadratics.
237. INTRODUCTION TO QUANTUM PHYSICS (3:3:0) Relativity and quantum theory applied to selected topics in atomic, molecular, solid state, and nuclear physics. Concurrent: PHYS 203 or 204 or 224.
265. (DN) INTRODUCTORY PHYSICS (4:3:2) Selected topics in light, electricity, and magnetism. Prerequisite or concurrent: PHYS 215.
297. SPECIAL TOPICS (1-9)

POLITICAL SCIENCE (PL SC)

001. (GS) AMERICAN NATIONAL GOVERNMENT (3:3:0) Development and nature of American political culture; constitutional and structural arrangements; policy-making processes; sources of conflict and consensus.
002. AMERICAN PUBLIC POLICY (3:3:0) Examination of selected areas of public policy in America. Analysis of policy content, alternatives, and impact. Prerequisite: PL SC 001.
003. (GS) GOVERNMENT AND POLITICS IN MODERN SOCIETY (3:3:0) Introduction to study of government and politics. Normative and empirical theories; governmental functions in modern communities; representative structures and processes.
014. INTERNATIONAL RELATIONS (3:3:0) Characteristics of modern nation-states and forces governing their international relations; nationalism; imperialism; diplomacy; current problems of war and peace. Credit will not be given for both this course and INT U 200.
020. COMPARATIVE POLITICS—WESTERN EUROPE (3:3:0) Comparative analysis of political cultures, interest groups, parties, and decision-making processes in principal Western European political systems.

PSYCHOLOGY (PSY)

002. (GS) PSYCHOLOGY (3:3:0) Introduction to general psychology; principles of human behavior and their applications.
015. ELEMENTARY STATISTICS IN PSYCHOLOGY (4:3:2) Frequency distributions and graphs; measure of central tendency and variability; normal probability curve; elementary sampling and reliability; correlations; simple regression equations. Prerequisites: PSY 002; MATH 005 or 2 units of secondary school algebra.
021. CURRENT APPLICATIONS OF PSYCHOLOGY (3:3:0) Topics may be drawn from but not limited to opinion research, selection and placement, behavior modification, attitude measurement and change. Prerequisite: PSY 002.
037. MENTAL HEALTH (3:3:0) Maintaining adjustment, developing a well-balanced personality; behavior disorders and their treatment. May not be used as a prerequisite for any course in Psychology. Not open to Psychology majors or those who have received credit for PSY 437.
170. PSYCHOLOGY OF WOMEN (3:3:0) Psychology of women in historical perspective and present evolvement. Stresses women's self-concepts with relation to individual and social psychological health. Prerequisite: PSY 002.
174. (SOC 174) PSYCHOLOGICAL AND SOCIOLOGICAL ASPECTS OF DEATH (3:3:0) An introductory, interdisciplinary approach to the psychology and sociology of death, stressing the significance of, and attitudes toward, mortality. Prerequisites: PSY 002, SOC 001.

202. (DS) INTRODUCTION TO PERCEPTION (3:3:0) Survey of human perception and processing of perceptual information, with some reference to animal literature. Emphasizes vision and audition. Prerequisite: PSY 002.
203. NEUROLOGICAL BASES OF HUMAN BEHAVIOR (3:3:0) An introduction to biopsychology, emphasizing the structure and function of the human brain.
204. (DS) INTRODUCTION TO LEARNING (3:3:0) A general survey of the learning area, including animal and human experiments, with the applicability of learning principles being discussed. Prerequisite: PSY 002.
211. VOCATIONAL BEHAVIOR (3:3:0) Theories of vocational selection and career change; research and application.
213. (DS) INTRODUCTION TO DEVELOPMENTAL PSYCHOLOGY (3:3:0) Developmental principles; physical growth; linguistic, intellectual, emotional, and social development from infancy to maturity. Prerequisite: PSY 002.
220. (LING 220) INTRODUCTION TO PSYCHOLINGUISTICS (3:3:0) The learning of language; language development in the child; meaning as a problem for psychology. Prerequisite: PSY 002.
221. (DS) INTRODUCTION TO COGNITIVE PSYCHOLOGY (3:3:0) Introduction to study of such higher mental processes as thinking and reasoning, imagery, concept formation, problem solving, and skilled performance. Prerequisite: PSY 002.
231. (DS) INDUSTRIAL PSYCHOLOGY (3:3:0) Personnel selection, training, accident prevention, morale, and organizational behavior. Prerequisites: PSY 002; PSY 015 or STAT 200.
236. (DS) [RL ST 236 (DS)] PSYCHOLOGIES OF RELIGION (3:3:0) Introduction to major Western psychologies of religion (James, Freud, Jung) and to subsequent extensions of and departures from them.
237. (DS) [RL ST 237 (DS)] RELIGIONS, CULTURES, AND THERAPIES (3:3:0) Comparison of methods and goals of selected religious and secular therapies within their cultural contexts. Prerequisite: PSY 002.
296. INDEPENDENT STUDIES (1-18)

QUANTITATIVE BUSINESS ANALYSIS (Q B A)

101. INTRODUCTION TO QUANTITATIVE BUSINESS ANALYSIS (3:3:0) Introduction to quantitative methods for conceptualizing business and management problems. Prerequisite: MATH 018 or 110.
102. ELEMENTARY BUSINESS STATISTICS (3:3:0) Statistical inference: estimation, hypothesis testing, correlation, and regression; application of statistical techniques to economic and business problems. Prerequisite: Q B A 101.
801. ELEMENTARY BUSINESS STATISTICS (3:3:0) Collection, tabulation, measurement, presentation, and interpretation of quantitative material. Prerequisite: third-semester standing.

RADIOLOGIC TECHNOLOGIST RADIOGRAPHER (R T R)

101. ORIENTATION AND MEDICAL TERMINOLOGY (3:3:9) Radiology history, radiation protection principles, medical ethics, with introduction to medical profession's language.
102. RADIOGRAPHIC POSITIONING I: NURSING PROCEDURES/CONTRAST MEDIA (3:3:9) Basic positional terminology; emphasis on skeleton with introduction to skull; radiological applications of contrast media and nursing pertinent to radiology. Prerequisite: R T R 101.
103. RADIOGRAPHIC EXPOSURE I: FILM CRITIQUE I (3:4:17) Preliminary exposure factors concerning radiographic imaging; evaluation of radiographic films. Prerequisite: R T R 102.
104. RADIOGRAPHIC POSITIONING II: SPECIAL PROCEDURES (3:3:13) Cranium and body system positioning; invasive contrast procedures pertinent to radiology. Prerequisite: R T R 103.

105. RADIOGRAPHIC EXPOSURE II: DARKROOM CHEMISTRY; FILM CRITIQUE II (3:3:13) Continuation of exposure factors concerning radiographic imaging, with emphasis on problem solving, evaluation of radiographs, and radiographic chemistry with processing techniques. Prerequisite: R T R 104.

106. RADIOGRAPHIC POSITIONING III: MEDICAL/SURGICAL DISEASES (3:5:17) Review of skeletal, cranium, and body systems, with emphasis on specialized positioning. Definition of various pathologies pertinent to bodily systems. Prerequisites: R T R 105, BIOL 041.

107. REGISTRY REVIEW I AND II (3:5:17) Registry Review I and II includes material in all required R T R courses, with emphasis upon national board examination. Prerequisite: R T R 106.

READING, COMMUNICATION, AND LANGUAGE EDUCATION (RCLED)

005. COLLEGE READING IMPROVEMENT I (3:3:0) Improvement of basic reading skills: vocabulary development; literal and interpretative comprehension; application of these skills more efficiently into college work. Prerequisite: limited to students whose academic profile sheets indicate help in reading is needed.

010. COLLEGE READING IMPROVEMENT II (3:3:0) Development of higher level comprehension, vocabulary, and study skills incorporated into content area reading. Prerequisite: RCLED 005.

REAL ESTATE (R EST)

100. REAL ESTATE PRACTICE (3:3:0) Study of real estate to enable individuals to make successful transactions and decisions. Not available to baccalaureate students or to those who have taken R EST 301.

301. REAL ESTATE FUNDAMENTALS (3:3:0) Introduction to urban real estate; economic forces affecting property rights; real estate markets and finance; land-use analysis; government policies.

800. REAL ESTATE PRINCIPLES (3:3:0) Nature of the real estate market; introduction to the functions performed in the real estate business.

810. REAL ESTATE SALES (3:3:0) Principles underlying the sale of real estate; the use of selling tools and procedures in the analysis of customers' needs.

830. REAL ESTATE FINANCE (3:3:0) Basic principles of real estate finance; sources of funds for financing real estate.

RELIGIOUS STUDIES (RL ST)

001. (GH) INTRODUCTION TO THE STUDY OF RELIGION (3:3:0) An historical and comparative survey of the principal beliefs and practices of the world's major religions.

140. (DH) RELIGION IN AMERICAN LIFE AND THOUGHT (3:3:0) The function, contributions, tensions, and perspectives of religion in American culture.

RETAILING (RTL)

840. MANAGEMENT IN THE HOME (3:3:0) The principles of decision making, work simplification, use of equipment, and home safety applied to family management.

850. DISPLAY TECHNIQUES (2:1:3) Display as visual communication, emphasizing the techniques related to merchandising and art. Prerequisite: an art or art appreciation course.

SCIENCE, TECHNOLOGY, AND SOCIETY (S T S)

100. THE ASCENT OF MAN (3:3:0) A survey of some of the intellectual achievements which highlight mankind's attempts to understand nature and shape the environment.

SOCIAL SCIENCE (SO SC)

001. (DS) URBANIZATION (3:3:0) An overview of the social sciences, including an interdisciplinary analysis of the urban process.

002. CONTEMPORARY SOCIETY (3:3:0) Selected contemporary issues in the perspective of history, sociology, psychology, economics, and political science.

110. (DS) INTRODUCTION TO CONTEMPORARY AFRICA (3:3:0) Consideration of influences and forces at work; leaders, elites, and groups. Analysis of problems and issues in Africa.

297. SPECIAL TOPICS (1-9)

SOCIOLOGY (SOC)

*001. (GS) INTRODUCTORY SOCIOLOGY (3:3:0) The nature and characteristics of human societies and social life.

003. (GS) INTRODUCTORY SOCIAL PSYCHOLOGY (3:3:0) The impact of the social environment on perception, attitudes, and behavior.

005. (GS) SOCIAL PROBLEMS (3:3:0) Current social problems such as economic, racial, and gender inequalities; social deviance and crime; population, environmental, energy, and health problems.

007. INTRODUCTION TO SOCIAL RESEARCH (3:3:0) Fundamental concepts and problems in social science research; design, measurement, sampling, causation, validity, interpretation. Prerequisite: 3 credits in sociology.

012. (DS) CRIMINOLOGY (3:3:0) Explanations and measurement of crime; criminal law; characteristics of criminals and victims; violent, property, white-collar, organized, and sexual crimes.

013. (DS) JUVENILE DELINQUENCY (3:3:0) Juvenile conduct, causes of delinquency, current methods of treatment; organization and function of agencies concerned with delinquency.

015. (DS) URBAN SOCIOLOGY (3:3:0) City growth and decline; impact of city life on individuals, families, neighborhoods, and government; urban life-styles.

023. (DS) POPULATION AND POLICY ISSUES (3:3:0) Local, national, and international population trends; basic techniques of demographic analysis; population problems; implications for public planning and policy.

030. (DS) SOCIOLOGY OF THE FAMILY (3:3:0) Family structure and interaction; functions of the family as an institution: cross-cultural comparisons.

047. (S T S 047) WILDERNESS, TECHNOLOGY, AND SOCIETY (3:3:0) Impact of developments in science, literature, and art on changing attitudes toward nature; consequences for conservation, preservation, environmental ethics.

055. (DS) WORK IN MODERN SOCIETY (3:3:0) The nature of work in varied occupational and organizational settings; current trends and work life in the future.

SOLAR TECHNOLOGY (S T)

801. INTRODUCTION TO SOLAR TECHNOLOGY (2:1:2) Introduction to solar technology from the standpoint of history, ecology, and energy.

*Students may take only one course for General Education credit from R SOC 011 or SOC 001.

SPANISH

804. ANALYSIS OF SOLAR HEATING AND COOLING SYSTEMS (3:1:5) Comprehensive analysis and application of solar heating and cooling systems. Calculations and layout. Prerequisite: fourth-semester standing.
806. PASSIVE SYSTEMS AND CONSERVATION METHODS (3:3:0) Passive concepts and designs; earth sheltering; energy audits and conservation techniques; wood burning equipment.
807. LIQUID SPACE HEATING AND DOMESTIC HOT WATER SYSTEMS (3:2:2) Liquid collectors, storage, and domestic hot water systems; pumps and piping; heat exchangers; fluid and component selection; power and controls. Prerequisites: S T 801, ME T 881.
808. AIR SYSTEMS AND CONVENTIONAL HEATING EQUIPMENT (3:2:2) Air collector and storage systems; fans and ductwork; heat exchange coils; controls; conventional-fired equipment operation. Concurrent: S T 807.
809. Nontechnical Aspects of Solar Technology (3:2:2) System sizing with f-chart method; economic analysis techniques; cost estimating; job scheduling; legal aspects; warranties; solar cooling methods and economics. Prerequisite: S T 801.
830. SELECTED TOPICS IN SOLAR HEATING AND COOLING TECHNOLOGY (3) Individual or group work in solar heating and cooling technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.

SPANISH (SPAN)

001. ELEMENTARY SPANISH I (4:3:2) Audio-lingual approach to basic Spanish; writing. Students who have received high school credit for two or more years of Spanish may not schedule this course for credit without permission of the department.
002. ELEMENTARY SPANISH II (4:3:2) Audio-lingual approach to basic Spanish continued; writing. Students who have received high school credit for four years of Spanish may not schedule this course for credit without permission of the department. Prerequisite: SPAN 001.
003. INTERMEDIATE SPANISH (4:3:2) Audio-lingual review of structure; writing; reading. Prerequisite: SPAN 002.
010. INTENSIVE SPANISH (6:5:2) Basic Spanish grammar; oral, aural, and writing skills. Essentially equivalent to SPAN 001, 002, 003, but offered in an accelerated five periods per week module.
020. INTENSIVE SPANISH (6:5:2) Continuation of SPAN 010. Prerequisite: SPAN 010.
130. (GH) IBERIAN CIVILIZATION (3:3:0) Spanish and Portuguese life from the medieval period to the present; literature, the arts, and contemporary problems in historical perspective.
131. (GH) IBERO-AMERICAN CIVILIZATION (3:3:0) Spanish American and Brazilian life from the Conquest to the present: literature, art, the indigenous heritage, and contemporary problems.
230. (DH) MASTERPIECES OF SPANISH LITERATURE IN ENGLISH TRANSLATION (3:3:0) Emphasis on works and authors of international importance. Lectures, readings, and written work in English.
231. (DH) MASTERPIECES OF SPANISH AMERICAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Emphasis on works and authors of international importance. Lectures, readings, and written work in English.

SPEECH COMMUNICATION (SPCOM)

100. (GWS) EFFECTIVE SPEECH (3:3:0) Introduction to speech communication: formal speaking, group discussion, analysis and evaluation of messages.
- Unit A.* Principles of communication, implemented through presentation of speeches, with some attention to group discussion and message evaluation.
- Unit B.* Principles of communication, implemented through group problem solving, with some attention to formal speaking and message evaluation.
- Unit C.* Principles of communication, implemented through analysis and evaluation of messages, with some attention to formal speaking and group discussion.

STATISTICS (STAT)

200. (GQ) **ELEMENTARY STATISTICS (4:3:2)** Descriptive statistics, frequency distributions, probability, binomial and normal distributions, statistical inference, linear regression, and correlation. Prerequisite: 2 units in algebra.

318. **ELEMENTARY PROBABILITY (3:3:0)** Combinatorial analysis, axioms of probability, conditional probability and independence, discrete and continuous random variables, expectation, limit theorems, additional topics. Prerequisite: MATH 141.

TELECOMMUNICATIONS (TELCM)

840. **INTRODUCTION TO TELECOMMUNICATIONS SYSTEMS (2:2:0)** Elements of telecommunications systems, including telephones, transmission lines, switching, digital data, and transmission by microwave, satellite, and fiber optics.

841. **SWITCHING AND TRAFFIC (3:3:0)** Routing of telecommunications messages: characteristics, methods, and control. Prerequisite: TELCM 840.

842. **INTRODUCTION TO TELECOMMUNICATIONS LABORATORY (1:0:2)** Techniques used for measurements of basic telecommunications circuits and equipment. Prerequisite or concurrent: TELCM 841.

843. **TRANSMISSION (3:3:0)** Transmission of telecommunications information, including design problems. Prerequisite: TELCM 840.

844. **ADVANCED TELECOMMUNICATIONS LABORATORY (1:0:2)** Testing and measurement of advanced telecommunication transmission and switching equipment, including practical alignment and testing of operational systems. Prerequisite or concurrent: TELCM 843.

THEATRE ARTS (THEA)

100. (GA) **THE ART OF THE THEATRE (3:3:0)** Survey of the history, craft, and art of the theatre to support an informed appreciation of theatrical events.

102. (DA) **FUNDAMENTALS OF ACTING (3:3:0)** Introduction to performance skills for the student with a general interest in acting.

103. **FUNDAMENTALS OF DIRECTING (3:3:0)** Training and experience in basic skills of directing. Designed for non-Theatre majors.

104. **FUNDAMENTALS OF THEATRE PRODUCTION (3:3:0)** Training and experience in basic skills of technical theatre. Designed for non-Theatre majors.

109. **THE DRAMATIC ARTS IN THE MASS MEDIA (3:3:0)** The place of television-radio-film drama in our culture; relationship with other art forms; standards of evaluation.

210. **INTRODUCTION TO CREATIVE DRAMATICS (3:1:4)** Introduction and direct experience in creative dramatics and survey of children's theatre.

296. **INDEPENDENT STUDIES (1-18)**

WILDLIFE (WILDL)

101. **INTRODUCTION TO WILDLIFE MANAGEMENT (3:3:0)** Basic principles of wildlife management. Introduction to general ecology and wildlife population dynamics.

103. **ANIMAL IDENTIFICATION (3:2:3)** Identification of mammals, birds, reptiles, and amphibians; introduction to their life histories.

204. **WILDLIFE MENSURATION (4:4:0)** Estimation and analysis of animal populations and their habitats, including sampling considerations and basic biometry. Prerequisite: 3 credits in mathematics.

207. **OUTDOOR RECREATION (3:2:3)** Sociology, history, and economics of recreational demand; recreational areas and management procedures.

WOMEN'S STUDIES

208. **TERRESTRIAL WILDLIFE MANAGEMENT (3:2:4)** Ecological characteristics and manipulation of terrestrial habitats; control of wildlife populations. Prerequisites: FOR 203, 240, WILDL 101, 103, 204, 802.

209. **ANIMAL HANDLING AND CARE (4:3:3)** Techniques in capturing, marking, and maintaining wild animals in captivity. Wildlife physiology, parasitology, and necropsy procedures are covered. Prerequisite: WILDL 101.

211. **AERIAL PHOTO INTERPRETATION (4:2:6)** Techniques of photo interpretation; type mapping of wildlife environments; photo censusing of wild animals.

213. **WETLAND AND FISHERIES MANAGEMENT (3:3:3)** Introduction to basic limnology. Ecology and management of swamp, marsh, pond, and stream habitats and their animal populations. Prerequisites: WILDL 101, 103, 204, 802.

802. **RECONNAISSANCE SURVEYS (2:1:3)** Use of topographic maps and hand-held compasses; survey methods using the staff compass, abney level, steel tape, and pacing. Reconnaissance mapping.

806. **OPERATIONAL PROCEDURES AND EQUIPMENT (2:1:3)** Operational procedures for wildlife-related equipment and facilities; field trips to wildlife management areas.

WOMEN'S STUDIES (WMNST)

001. (GS) **WOMEN'S STUDIES (3:3:0)** Interdisciplinary consideration of the scholarly theories and research pertaining to women's experiences and women's status in contemporary American society.

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UNIVERSITY CALENDAR*

SPRING SEMESTER 1989

JANUARY

- 4 Wednesday—Arrival date
- 5-6 Thursday, Friday —
Registration
- 9 Monday—Classes begin

FEBRUARY

27, 28

MAR. 1-3 Spring holiday, no classes

APRIL

- 28 Friday—Classes end
- 29, 30 Saturday, Sunday—
Study days

MAY

- 1-6 Monday to Saturday—
Final examinations
- 13-14 Saturday, Sunday—
Spring commencement

SUMMER SESSION 1989

Intersession

MAY

- 8 Monday—Classes begin

JUNE

- 2 Friday—Classes end

Eight-Week Session

JUNE

- 4 Sunday—Arrival date
- 5-6 Monday, Tuesday—
Registration
- 7 Wednesday—Classes begin

JULY

- 4 Tuesday—Independence Day
holiday, no classes#

AUGUST

- 2 Wednesday—Classes end
- 3-5 Thursday-Saturday—
Final examinations
- 12 Saturday—Summer
commencement

Six-Week Session

JUNE

- 20 Wednesday—Classes begin

AUGUST

- 2 Wednesday—Classes end

*This calendar is subject to change without notice. Although the University makes every effort to avoid conflicts with religious holidays in preparing the calendar for an academic year, such conflicts are sometimes unavoidable. When they occur, efforts are made to make special arrangements for the students affected.

#Classes that would have met on Tuesday, July 4, 1989, will meet on Wednesday, August 2, 1989.

FALL SEMESTER 1989

AUGUST

- 19 Saturday—Arrival date for new students
- 20 Sunday—Arrival date for returning students
- 21–22 Monday, Tuesday—Registration
- 23 Wednesday—Classes begin

SEPTEMBER

- 4 Monday—Labor Day holiday, no classes+

NOVEMBER

- 23–24 Thursday, Friday—Thanksgiving holiday, no classes

DECEMBER

- 8 Friday—Classes end
- 9–10 Saturday, Sunday—Study days

JANUARY

- 6 Saturday—Fall commencement

SPRING SEMESTER 1990

JANUARY

- 3 Wednesday—Arrival date
- 4–5 Thursday, Friday—Registration
- 8 Monday—Classes begin

FEBRUARY

- 26–28, Mar. 1–2 Spring holiday, no classes

APRIL

- 27 Friday—Classes end
- 28–29 Saturday, Sunday—Study days
- 30,

MAY

- 1–5 Monday to Saturday—Final examinations
- 12–13 Saturday, Sunday—Spring commencement

SUMMER SESSION 1990

Intercession

MAY

- 7 Monday—Classes begin

JUNE

- 1 Friday—Classes end

Eight-Week Session

JUNE

- 3 Sunday—Arrival date
- 5 Tuesday—Registration
- 6 Wednesday—Classes begin

JULY

- 4 Wednesday—Independence Day holiday, no classes#

AUGUST

- 1 Wednesday—Classes end
- 2–4 Thursday–Saturday—Final examinations
- 11 Saturday—Summer commencement

Six-Week Session

JUNE

- 20 Wednesday—Classes begin

AUGUST

- 1 Wednesday—Classes end

+Classes that would have met on Monday, September 4, 1989, will meet on Wednesday, December 6, 1989.

#Classes that would have met on Wednesday, July 4, 1990, will meet on Wednesday, August 1, 1990.

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College Place, DuBois, PA 15801
 (814) 371-2800

FAYETTE CAMPUS

P.O. Box 519, Uniontown, PA 15401
 (412) 430-4100

HAZLETON CAMPUS

Highacres, Hazleton, PA 18201
 (717) 450-3000

THE MILTON S. HERSHEY MEDICAL CENTER

500 University Drive, Hershey, PA 17033
 (717) 531-8521

McKEESPORT CAMPUS

University Drive, McKeesport, PA 15132
 (412) 675-9000
 (412) 462-6401 (Pgh.)

MONT ALTO CAMPUS

Mont Alto, PA 17237
 (717) 749-3111

NEW KENSINGTON CAMPUS

3550 Seventh Street Road, New Kensington, PA 15068
 (412) 339-7561

OGONTZ CAMPUS

1600 Woodland Road, Abington, PA 19001
 (215) 886-9400

**PENN STATE ERIE,
 THE BEHREND COLLEGE**
 Station Road, Erie, PA 16563
 (814) 898-6000

† PENN STATE GREAT VALLEY

30 East Swedesford Road, Malvern, PA 19355
 (215) 889-1300

PENN STATE HARRISBURG

Route 230, Middletown, PA 17057
 (717) 948-6000

SCHUYLKILL CAMPUS

P.O. Box 308, Route 61 South
 Schuylkill Haven, PA 17972
 (717) 385-4500

SHENANGO VALLEY CAMPUS

147 Shenango Avenue, Sharon, PA 16146
 (412) 983-5800

WILKES-BARRE CAMPUS

P.O. Box PSU, Lehman, PA 18627
 (717) 675-2171

WORTHINGTON SCRANTON CAMPUS

120 Ridge View Drive, Dunmore, PA 18512
 (717) 963-4757

YORK CAMPUS

1031 Edgecomb Avenue, York, PA 17403
 (717) 771-4586

*Upper-division and graduate courses

†Graduate courses

| LOCATIONS | ALTOONA | BEAVER | BEHREND COLLEGE | BERKS | DELAWARE COUNTY | DuBOIS | FAYETTE | HAZLETON | HERSHEY MEDICAL CENTER† | McKEESPORT | MONT ALTO | NEW KENSINGTON | OGONTZ | SCHUYLKILL | SHENANGO VALLEY | UNIVERSITY PARK | WILKES-BARRE | WORTHINGTON SCRANTON | YORK | ASSOCIATE DEGREE MAJORS |
|-----------|---------|--------|-----------------|-------|-----------------|--------|---------|----------|-------------------------|------------|-----------|----------------|--------|------------|-----------------|-----------------|--------------|----------------------|------|---|
| | • | • | • | • | • | • | • | • | | • | • | • | • | • | • | | • | • | • | Agricultural Business (1) |
| | • | • | • | • | • | • | • | • | | • | | • | • | • | • | | • | • | • | Architectural Engineering Technology |
| | • | • | • | • | • | • | • | • | | • | | • | • | • | • | | • | • | • | Biomedical Equipment Technology (2) |
| | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | Building Energy Systems Technology (3) |
| | • | • | • | • | • | • | • | • | | • | • | • | • | • | • | • | • | • | • | Business Administration† |
| | | | | | | | | | | • | | | | • | | | | | | Chemical Engineering Technology (9) |
| | | | | | | | | | | | | | | | | | | | | Computer Science |
| | • | • | • | • | • | • | • | • | | • | | • | • | • | • | | • | • | • | Dietetic Food Systems Management# |
| | | | | | | | | | | | • | | • | • | | | • | • | • | Electrical Engineering Technology |
| | | | | | | | | | | | | | | | | | • | | | Forest Technology |
| | | | | • | | | | | | | | | | | | | | | | Highway Engineering Technology (9) |
| | | | | | • | | | | | | | | | • | | | | | | Hotel, Restaurant, and Institutional Management |
| | | | • | • | | | | | | | | | | | | | | | | Individual and Family Studies and Services* |
| | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | Labor Studies* (9) |
| | • | • | • | • | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | Letters, Arts, and Sciences* |
| | • | • | • | • | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | Materials Engineering Technology (9) |
| | | | | | • | | • | • | | | • | | | • | | | • | • | • | Mechanical Engineering Technology |
| | • | • | • | • | • | • | • | • | • | | • | • | • | • | • | | • | • | • | Medical Laboratory Technology (5) |
| | • | | | | • | • | • | • | | | • | • | • | • | | | • | • | • | Microcomputer Engineering Technology (6) |
| | • | • | • | • | • | • | • | • | • | | • | • | • | • | • | | • | • | • | Mining Technology (9) |
| | | | | | | | • | | | • | | | | | | | | | | Nuclear Engineering Technology (7) |
| | | | | | | | | | | • | | | | | | | | | | Physical Therapist Assistance |
| | • | • | | | • | | | | • | | • | | | • | | | • | | | Railway Engineering Technology (9) |
| | | | | | | | | | | | • | | • | | | | | | | Science—General Option |
| | | | | | | | | | | | | • | • | | | | | | | Science—Radiologic Technologist |
| | | | | | • | | • | | | | | | | • | • | | | | | Radiographer Option |
| | | | | | | | | | | | | | | | | | | | | Sociology* |
| | • | • | • | • | • | • | • | • | • | | • | • | • | • | | | • | | | Surveying Technology |
| | | | | | • | | | | | | | | • | • | | | • | • | • | Telecommunications Technology (8) |
| | | | | | | | | | | | | | | | | | | | | Wildlife Technology |

- (1) Second year offered only at University Park.
- (2) Second year offered only at New Kensington and Wilkes-Barre.
- (3) Second year offered only at Fayette.
- (4) Second year offered only at Berks.
- (5) Begins summer session only. Second year offered only at Hazleton and New Kensington. Admission to this program is highly competitive.
- (6) Second year offered only at McKeesport, New Kensington, Schuylkill, and Worthington Scranton.
- (7) Second year offered only at Beaver.
- (8) Second year offered only at Delaware County, McKeesport, and Wilkes-Barre.
- (9) This program is not currently being offered to entering students.

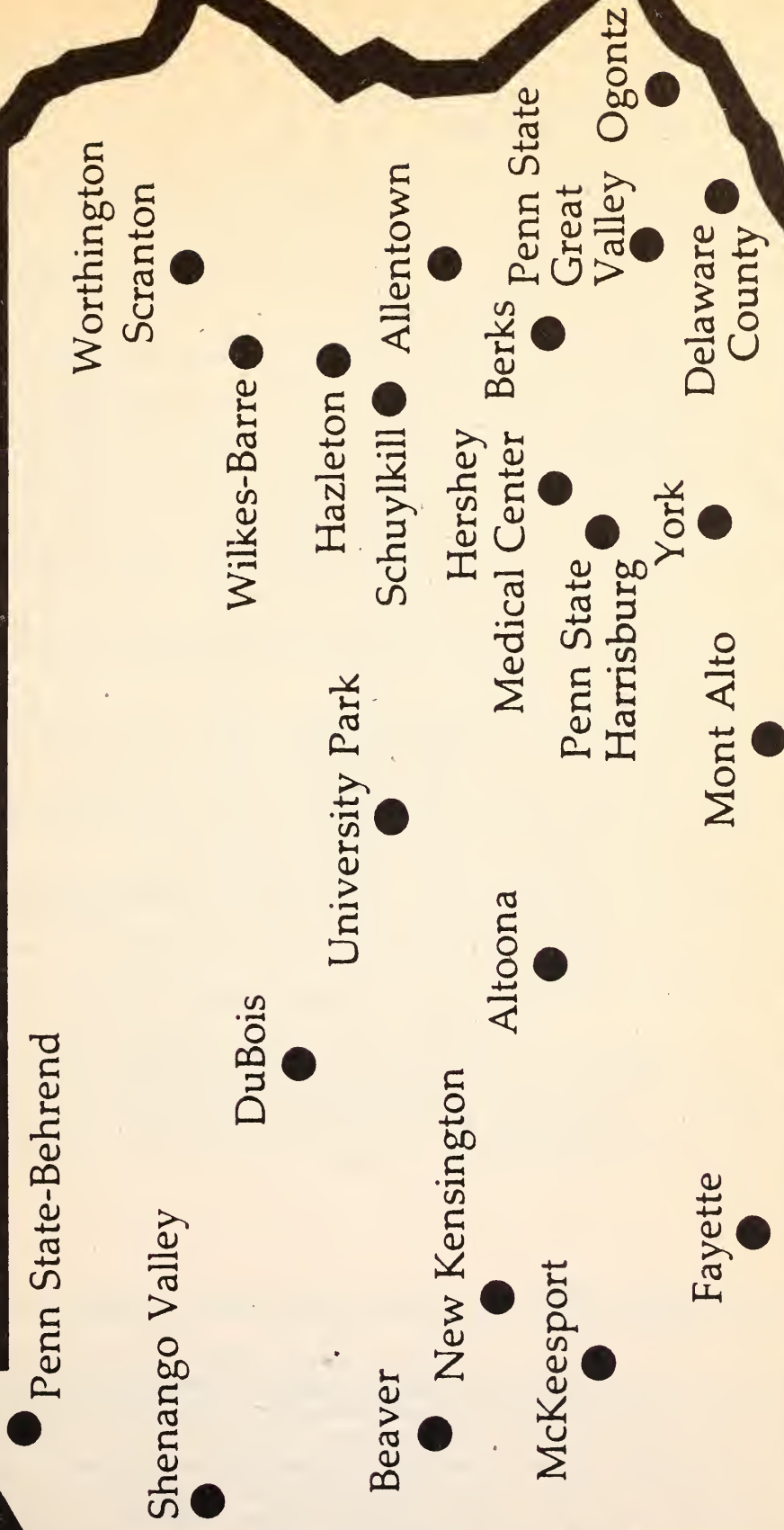
† The two-year Business Administration major offered at Penn Behrend, Hershey Medical Center, Ogontz, and University Park is intended for nontraditional students who want to pursue part-time (primarily evening) study.

‡ Programs offered at Hershey Medical Center are intended primarily for nontraditional students who want to pursue part-time (primarily evening) study. Interested students should write to the Continuing Education Office, Department 4006, 205 Eastmoor Building, P.O. Box 17033, Hershey, PA 17033.

* The two-year majors in Individual and Family Studies and Service Labor Studies, and Sociology are offered as *extended degree* programs for students who want to pursue part-time (day or evening) study. The two-year major in Letters, Arts, and Sciences also may be taken as an *extended degree* program at all University locations. Interested students should write to the Admissions Office or the nearest State campus to request a special application for extended degree programs.

This program is available primarily through the Department of Independent Learning. Interested students should write to the Undergraduate Admissions Office at University Park, the Continuing Education Office at the nearest Penn State campus, or the Department of Independent Learning, 128 Mitchell Building, The Pennsylvania State University, University Park, PA 16802 for more information and to request a special application for extended degree programs.

PENN STATE'S CAMPUS SYSTEM



THE UNIVERSITY

MISSION OF THE UNIVERSITY

Penn State is a comprehensive, multicampus research university, serving all regions of the Commonwealth, as well as the nation and the world, in instruction, research, and service roles that require responsiveness to and support from society's public and private sectors.

As a comprehensive land-grant university, Penn State has responsibility for providing a wide array of programs in the professional and technical disciplines as well as a balanced offering of undergraduate and graduate programs in the arts and sciences.

The University shares with other major research universities the traditional responsibilities to discover, develop, preserve, and disseminate knowledge.

Penn State's multicampus delivery system establishes the University as uniquely fitted to maintain extensive continuing education and other public service programs that serve the diverse geographical and economic areas of the state and region.

The more immediate goals of the University grow from its traditions, focus on its strengths, and point to its future opportunities. These goals are summed up by one all-embracing directive: to secure its status among the best public research universities in the nation.

To foster this overall directive, the University sets for itself the following specific goals to guide its planning for the immediate future:

- To make available to qualified students, at a reasonable cost, a selected but wide range of quality undergraduate and graduate educational programs for degree students and for adults concerned with lifelong professional and personal development.

- To improve the intellectual environment and increase the level of financial support necessary to recruit and graduate the highest-quality undergraduate and graduate students, while assuring continuing opportunity for a broad range of qualified students to acquire a Penn State education.

- To transform a significant number of the University's graduate programs from adequacy to excellence, maintaining or enhancing the programs that already are excellent, and strengthening the University's national and international reputation as a graduate institution.

- To enhance, in both quality and quantity, the research enterprise of the University.

- To increase significantly the opportunities for attracting, developing, and retaining faculty who are committed to excellence in teaching and research.

- To enhance the climate for developing interdisciplinary instructional and research programs at both the undergraduate and graduate levels.

- To promote further growth of international programs and services, especially in graduate education and research.

- To extend educational opportunities for Blacks, Hispanics, and other minorities and generally strengthen the University's affirmative action programs for faculty, staff, and students.

- To utilize more effectively the University's statewide network of campuses by increasing their diversity in mission, role, and scope of programs.

- To revitalize the University's General Education program as part of a broader strengthening of undergraduate education.

RESIDENT INSTRUCTION

The undergraduate degree programs of the University provide students with opportunities to increase their knowledge and understanding of the world, and to grow in their individual skills and capabilities for learning, analyzing, judging, creating, and communicating. All undergraduate degree programs and courses offered by the colleges and other degree-granting units of the University are under the academic sponsorship of a faculty committed to scholarship and are implemented under the academic policies and student rules established by the University Faculty Senate. They are intended to be flexible in accommodating students interested in learning, whether through traditional or nontraditional offerings, while enrolled on either a part-time or a full-time basis. The degree programs and courses of the colleges and other degree-granting units are offered through University administrative arrangements identified as Resident Instruction and Continuing Education.

The primary mission of Resident Instruction is to provide credit courses to degree candidates on University campuses as well as to administer certain off-campus credit-granting activities such as internships, practicums, field trips, and foreign studies. Students not formally admitted to degree candidacy (including provisional and nondegree students) may participate in Resident Instruction offerings as time and space permit.

HISTORY

THE PENNSYLVANIA STATE UNIVERSITY, chartered by the Pennsylvania Legislature as the Farmers' High School in 1855, was founded by professional men, educated farmers, and state and county agricultural leaders. A faculty of four met the incoming class of sixty-nine students in February 1859.

In May 1862, the institution was renamed the Agriculture College of Pennsylvania, a name that recognized that its work was of collegiate level. Two months later, on July 2, President Abraham Lincoln signed the Morrill Land Grant Act, offering each state free public land that it could sell to endow institutions of higher learning where "the leading object shall be, . . . to teach such branches of learning as are related to agriculture and the mechanic arts . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

On April 1, 1863, the state legislature declared that the Morrill Act "is hereby accepted by the State of Pennsylvania with all its provisions and conditions and the faith of the State is hereby pledged to carry the same into effect." The legislature then designated Penn State as the land-grant college of the Commonwealth.

The College broadened the scope of its instruction, began to admit female students, increase its enrollment, and enlarge its physical plant. Graduate work was offered as early as 1862. In 1874, the college was renamed the Pennsylvania State College.

In 1953, the name was changed again—to The Pennsylvania State University—in formal recognition of what Penn State had long since become, one of the country's leading universities. Its nine undergraduate colleges and the School of Communications now offer 128 baccalaureate and 25 associate degree majors. Penn State Erie, The Behrend College, offers 22 complete baccalaureate programs. Penn State Harrisburg offers 24 baccalaureate degree majors. Graduate students may choose from 139 approved fields of study. The College of Medicine, at The Milton S. Hershey Medical Center in Hershey, offers the M.D. degree, the M.S. and Ph.D. in anatomy, biological chemistry, cell and molecular biology, genetics, microbiology, neuroscience, pharmacology, and physiology, and the M.S. degree in laboratory animal medicine.

The original student body of 69 has grown to 69,176, the faculty of four to 4,353. Beginning with an educational program that offered 40 courses, Penn State today offers 5,272 undergraduate and 3,225 graduate courses and 187 medical courses. The University, whose prime purpose has always been to serve the people and the interests of the Commonwealth and the nation, is accredited by the Middle States Association and is a member of the Association of American Universities.

ACADEMIC ORGANIZATION OF THE UNIVERSITY

COLLEGES AND OTHER DEGREE-GRANTING UNITS

The University has nine colleges and one school that offer undergraduate majors leading to baccalaureate and associate degrees: College of Agriculture, College of Arts and Architecture, College of Business Administration, College of Earth and Mineral Sciences, College of Education, College of Engineering, College of Health and Human Development, College of the Liberal Arts, and College of Science. Additional degree-granting units of the University are the School of Communications; Penn State Erie, The Behrend College; and Penn State Harrisburg. Penn State-

GENERAL INFORMATION

Behrend and Penn State Harrisburg provide an alternative educational setting in which students may enroll in selected degree programs.

THE COMMONWEALTH EDUCATIONAL SYSTEM

The Commonwealth Educational System is the administrative organization for the University's system of Commonwealth Campuses and for the delivery of continuing education programs throughout the Commonwealth. Through the seventeen Commonwealth Campuses and the Continuing Education offices at University Park, Penn State Erie, The Behrend College; Penn State Harrisburg; Hershey; Penn State Great Valley; and Williamsport, the Commonwealth Educational System offers a wide array of University courses and programs at locations convenient to virtually all of the population of the Commonwealth.

The Division of Technology of the Commonwealth Educational System, in cooperation with the College of Engineering, is administratively responsible for the associate degree majors in engineering technology offered at the Commonwealth Campuses. The division director is responsible for the coordination and leadership among the college, campuses, and local industry and provides a central advocate for the engineering technology programs. The general manager is responsible for the University Division of Media and Learning Resources. The division includes Audio-Visual Services; Independent Learning; WPSX-TV; and Photo/Graphic Services.

COMMONWEALTH CAMPUSES—In addition to the University Park Campus in the municipality of State College, Penn State-Behrend, and Penn State Harrisburg, full-time instruction is available at seventeen Commonwealth Campuses: Allentown (Fogelsville); Altoona; Beaver (Monaca); Berks (Reading); Delaware County (Media); DuBois, Fayette (Uniontown); Hazleton; McKeesport; Mont Alto; New Kensington; Ogontz (Abington); Schuylkill (Schuylkill Haven); Worthington Scranton (Dunmore); Shenango Valley (Sharon); Wilkes-Barre (Lehman); and York.

TWO-YEAR ASSOCIATE DEGREE MAJORS

Majors that lead to two-year associate degrees are available at Penn State Erie, The Behrend College, and all seventeen of the University's Commonwealth Campuses except Allentown, as listed previously in this bulletin. These majors provide concentrated instruction to prepare graduates for specialized occupational assignments, except for the Letters, Arts, and Sciences major, which provides graduates with a general education and some specialization in their fields of interest. In addition, a major in Dietetic Food Systems Management is available primarily through the Department of Independent Learning.

Twenty-eight associate degree majors lead to either the Associate in Arts degree, the Associate in Engineering Technology* degree, or the Associate in Science degree. The majors leading to these degrees are listed on the following page.

Associate in Arts Degree

Labor Studies
Letters, Arts, and Sciences
Sociology

Associate in Engineering Technology Degree

Architectural Engineering Technology+
Biomedical Equipment Technology+
Building Energy Systems Technology+
Chemical Engineering Technology+
Electrical Engineering Technology+
Highway Engineering Technology+
Materials Engineering Technology
Mechanical Engineering Technology+
Microcomputer Engineering Technology
Mining Technology
Nuclear Engineering Technology+
Railway Engineering Technology+
Surveying Technology+
Telecommunications Technology+

Associate in Science Degree

Agricultural Business
Business Administration
Computer Science
Dietetic Food Systems Management
Forest Technology
Hotel, Restaurant, and Institutional Management
Individual and Family Studies and Services
Medical Laboratory Technology
Physical Therapist Assistance
Science
Wildlife Technology

A description of the purposes, objectives, and content of each two-year major is given on the succeeding pages.

Most of Penn State's associate degree enrollment at present is concentrated in its engineering technology majors. Programs that are accredited by the Technology Accreditation Commission, Accreditation Board for Engineering and Technology (TAC/ABET) are indicated. Accreditation applies to each program at campuses where both years of that program are taught. Engineering technology is that part of the technological field that requires the application of scientific and engineering knowledge and methods combined with technical skills in support of engineering activities; it lies in the occupational spectrum between the craftsperson and the engineer at the end of the spectrum closer to the engineer. The engineering technology graduate, a specialist in applied rather than theoretical technology, is equipped to translate creative ideas into new machines, products, structures, and processes.

*Division of Technology, Commonwealth Educational System
+Accredited by TAC/ABET

GENERAL INFORMATION

The Commonwealth Campuses and Penn State-Behrend also offer up to two years of work in most of the four-year baccalaureate degree majors offered by the University.

STATEMENT OF BASIC ACADEMIC ADMISSION POLICIES—Admission to University credit courses or degree candidacy at The Pennsylvania State University is governed by policies established by the University Faculty Senate. Although specific applications of these policies may vary from year to year, from location to location, and from program to program, all University admissions are governed by the following general policies:

1. As an institution of higher education, The Pennsylvania State University is committed to making post-high school education available to all who possess a high school diploma or its equivalent without restriction as to race, sex, religion, color, ancestry, national origin, ethnic origin, handicap, or age as provided by law.
2. The primary responsibility of the University is to residents of the Commonwealth of Pennsylvania. Consequently, within limits expressed from time to time by the Board of Trustees of the University, preference shall be given to Pennsylvania residents in the various admissions processes.
3. In order to meet the variety of goals and objectives of the population, the spectrum of offerings is designed to enable persons with a variety of objectives—both degree and nondegree—to receive a higher education. Although access to educational opportunities of the University is open to all, courses offered for credit are available to those holding a high school diploma or its equivalent. Policies governing admission to degree candidacy are established by the University Faculty Senate (with delegation of policies governing admissions to graduate programs to the Graduate Faculty of the University) under a general policy of offering admission to those whose past academic performance indicates a reasonable probability of success.
4. Undergraduate students are admitted to either baccalaureate degree candidacy or associate degree candidacy. To be admitted to degree candidacy, the individual must present an academic performance record that indicates a reasonable probability of his or her success in his or her chosen program. In the case of freshman admission to undergraduate degree candidacy, performance is measured through the high school record and standardized test results. In the case of advanced standing admission, performance is measured either through success in nondegree programs and courses of the University or by success at some other institution of higher education.
5. Within the space available in particular programs and at particular locations, admission shall be offered preferentially to those whose performance record indicates the highest probability of success in the chosen program—with this process continuing until all available spaces are filled. Although exceptions to this policy may be made from time to time (for example, recipients of scholarships with restricting qualifications), these exceptions may be made only for students who meet at least the minimum admission and entrance requirements.
6. If a college or school requires restrictions on its baccalaureate admissions, the priorities or targets established must include provisions to consider qualified students in each of these groups:
 - Admissions Group I—Freshman Admissions: Students who hold a high school diploma or equivalent, who present fewer than 18 credits of baccalaureate work (from The Pennsylvania State University or another regionally accredited institution), who meet minimum college or school entrance requirements, and who meet minimum college or school admission standards are considered in this group.
 - Admissions Group II—The Pennsylvania State University Advanced Standing Admissions: Students who (1) request baccalaureate degree readmission, presenting 18 or more credits; (2) request a change from The Pennsylvania State University associate degree to baccalaureate degree status, presenting 18 or more applicable credits; or (3) request a change for The Pennsylvania State University provisional degree to baccalaureate degree status, presenting 18 or more applicable credits, are considered in this group. In all advanced standing admissions at The Pennsylvania State University, the student must have a G.P.A. of at least 2.00 and must

meet the minimum entrance and advanced standing requirements of the college or school.

Admissions Group III—Other Advanced Standing Admissions: Students who (1) request changes from The Pennsylvania State University nondegree to baccalaureate degree status, presenting 18 or more applicable credits; or (2) have not been students at Penn State and request baccalaureate degree status at Penn State, presenting 18 or more applicable credits from a regionally accredited institution. In all advanced standing admissions it is understood that the student must have a G.P.A. of 2.00 as computed at Penn State and meet the minimum entrance and advanced standing requirements of the college or school.

Within these three groups, no special consideration will be given to any group; students will be admitted to the college or school on the basis of academic competition (e.g., SAT scores, grade-point averages, grades in required courses in the college or school, and other evidence predictive of baccalaureate degree performance where available, valid, and reliable).

7. To ensure a proper educational mix of students and to further broaden the educational opportunities offered by the University, the University Faculty Senate and the University administration from time to time may authorize various specialized programs. These programs may permit students who do not meet the basic qualifications for admission to degree candidacy to be admitted to such candidacy. These programs may also permit, in selected situations, exceptional students who have not earned a high school diploma or its equivalent to enroll in University credit courses. Such specialized programs may include up to 10 percent of the total admission group for the University in any one year and up to the maximum of 15 percent of the admission to any geographic location of the University.
8. Within this general policy, the colleges and school of the University, with the concurrence of the University Faculty Senate, may impose certain educational background requirements (Carnegie Units) that must be completed by an individual before being admitted to degree candidacy.

ADMISSION REQUIREMENTS—Freshman Admission—A person who holds a high school diploma or its equivalent and who has not taken credit courses at an institution of higher learning, or a person who holds a high school diploma or its equivalent and who has taken fewer than 18 semester credits at a regionally accredited college or university, may be considered for admission as a freshman.

Applicants for admission to all associate degree programs must submit scores of the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board or the American College Test (ACT).

To be admitted to degree candidacy, the applicant must have completed educational background requirements called Carnegie Units or secondary school units. To determine whether you have the appropriate secondary school units required for your choice of a program of study, refer to the chart in this bulletin titled "Secondary School Units Required for Admission Consideration for Associate Degree Programs." Find the program of your choice and read across to determine the necessary units.

An applicant must state in writing whether he or she has attended any other institution of higher learning, even though advanced standing is not desired. Failure to indicate, at the time of application, previous registration in another institution may result in refusal or cancellation of admission.

An application may be obtained from the Undergraduate Admissions Office, 201 Shields Building, Box 3000, The Pennsylvania State University, University Park, PA 16802. Telephone: (814) 865-5471. An application may also be obtained from an admissions officer at any Commonwealth Campus, Penn State-Berrend, or a Penn State Community Recruitment Center.

The University reserves the right to reject any applicant for admission for any reason the University determines to be material to the applicant's qualifications to pursue higher education.

Admission with Advanced Standing—An applicant who has attempted at least 18 semester credits at a regionally accredited college or university and has a minimum cumulative grade-point average of at least 2.00 (on a 4.00 scale as computed at Penn State) for all graded courses at all colleges and universities previously attended, and has met the minimum secondary school requirements, including graduation from high school, may be considered for admission with advanced standing.

In all cases where work has been taken at other institutions, an official transcript from each place of

attendance must be submitted directly to the Undergraduate Admissions Office by the institutions attended. The latter must include evidence that the student was honorably dismissed and was in good academic standing at the time of leaving. Failure to indicate, at the time of application, previous registration in another institution may result in refusal or cancellation of admission.

Advanced standing credits may be awarded for work taken at regionally accredited institutions provided the grade earned is equivalent to a grade of A, B, or C at this university, and the credits are useful to the student's program of study. Credits are transferred, but grades and grade points are not. Advanced standing students enter the University without an average, and their average begins with the completion of their first semester of study at Penn State.

Associate degree programs have a limit on the number of credits that may be accepted by transfer from regionally accredited institutions. Information about credit limitations may be obtained from the academic official responsible for a particular program.

In certain circumstances, the University may need to restrict advanced standing admissions to particular programs because of space limitations.

Provisional Student (Degree-Seeking)—An applicant seeking to pursue a degree program and holding a high school diploma or its equivalent but without the criteria required for admission as a degree candidate may enroll in credit courses at the University. A provisional student may enroll in credit courses if the following criteria are met:

1. The student is making satisfactory progress toward admission as a degree candidate. Progress is satisfactory if a student has earned 18 credits with a minimum grade-point average of 2.00 (on a 4.00 scale). If a student attempted 18 credits and earned less than a 2.00, the student is given a warning. A student who has attempted 27 credits with a grade-point average of less than 2.00 will not be permitted to enroll as a provisional student in any subsequent semester. No student, regardless of cumulative grade-point average, who has completed 36 credits will be permitted to enroll as a provisional student in any subsequent semester.
2. There is space available after degree candidates have been accommodated.
3. The student has not been dropped for unsatisfactory scholarship from any college or university previously attended.
4. The student has not been dismissed or suspended for nonacademic reasons from any college or university. An applicant not in good standing at another accredited college or university for disciplinary reasons may petition for an exception to the policy.

A provisional student may apply to become an associate degree candidate after completing 9 credits of Penn State course work with a minimum grade-point average of 2.00. The applicant must also satisfy the entrance requirements of either the major in which enrollment is desired or of the Division of Undergraduate Studies if the student wishes to enroll in that division. An applicant who has completed at least the equivalent to one year's associate degree work before applying for admission as an associate degree candidate must have the approval of either the dean of the college or school in which enrollment is desired or of the director of the Division of Undergraduate Studies if the student wishes to enroll in that division. After a student is admitted as a degree candidate, the dean of the college or school of enrollment decides which credits earned as a provisional student may be used to fulfill the degree requirements.

Nondegree Student—Any person having received a high school diploma or its equivalent may be permitted to enroll in credit courses (either for credit or audit) at the University. Some of these persons will be classified as nondegree students.

A nondegree student who has not been dropped from degree or provisional status by this university or any other college or university for unsatisfactory scholarship will be listed as a nondegree-regular student and may enroll in any number of credits not to exceed the typical credit load of a full-time student per semester if criteria 1, 2, and 3 are met.

A nondegree student who has been dropped from degree or provisional status by this university or any other college or university because of unsatisfactory scholarship will be listed as a nondegree-conditional student and may enroll in a maximum of 10 credits per semester if criteria 1, 2, 3, and 4 are met:

1. The student has completed the prerequisite for the courses to be scheduled or has obtained permission from the instructor to schedule the course.
2. Space is available after degree candidates and provisional students have been accommodated.
3. The student has not been dismissed or suspended for nonacademic reasons from any college or university. An applicant not in good standing at another accredited college or university for disciplinary reasons must consult with the director of the Office of Conduct Standards for admission clearance.
4. The student has obtained academic advising/counseling from an adviser/counselor designated by the academic unit to which admission, or reinstatement and readmission, is desired.

Note: A student must be admitted, or reinstated and readmitted, as a degree candidate to apply the credits earned as a nondegree student toward fulfilling the requirements for a degree. The dean of the college or school of enrollment shall decide which credits may be used to fulfill the degree requirements.

An individual desiring to take associate degree courses as a provisional student (degree-seeking) or nondegree student should submit the appropriate application for admission. An application may be obtained from the Undergraduate Admissions Office, 201 Shields Building, Box 3000, The Pennsylvania State University, University Park, PA 16802. Telephone: (814) 865-5471. Applications may also be obtained from an admissions officer at any Commonwealth Campus, Penn State-Behrend, or a Penn State Community Recruitment Center.

PROGRAMS FOR NEW STUDENTS—The Office of Programs for New Students works to assure that freshmen at all Penn State campuses, as well as advanced standing and change-of-assignment students at University Park, are provided with a comprehensive introduction to the essential academic and student development opportunities of the campus and the University in general beginning with a new student's acceptance to a campus and continuing through completion of the new student's first semester.

Through the programs of this office, offered in cooperation with the colleges' academic units and various student service operations, new students are introduced to the intellectual and scholarly expectations of the University, to the skills needed for advanced study and lifelong learning, and to the student development opportunities with academic merit. In addition, this office provides a series of publications designed to introduce the University, to inform students of the required procedures for matriculation, and to offer a perspective on college life. These publications also give new students practical information about important dates, times, and locations (e.g., arrival day, first day of classes, course drop/add, etc.).

Many programs for new students are scheduled during arrival week each semester. During this period, new students receive instruction and counseling concerning their courses of study and participate in extracurricular and cultural activities. Registration is also held during arrival week.

BASIC SKILLS—The Basic Skills Program consists of both academic services and courses designed to bridge gaps between high school preparation and minimum college-level skills needed in introductory University courses. The primary goal of this program is to help students eliminate specific weaknesses (as indicated by FTCAP placement scores) in English, reading, math, and other related learning skills areas.

All students entering the freshman class in an associate degree major are tested for basic skills in English composition and mathematics. Students identified with major weaknesses in English composition are required to enroll in ENGL 004 (3 credits) prior to scheduling ENGL 015.

ENGL 004 provides intensive practice in writing sentences and paragraphs as well as instruction in grammar, usage, and punctuation. If more practice is needed in this area, students are advised to schedule a 1-credit tutorial, ENGL 005, along with ENGL 004. Credits earned in ENGL 004 and 005 do not substitute for minimum program requirements designated under the categories "General

GENERAL INFORMATION

Education," "Requirements for the Major," and "Electives." This stipulation also applies to the courses listed below in reading and in certain pre-calculus-level math courses.

Assistance in reading is available through a series of college reading improvement courses: RCLED 005 and 010. Each course is offered for 3 credits. Consult the course description section for a complete description.

Students with mathematics weaknesses are encouraged to strengthen these skills by reviewing the following topics: operations with rational numbers and decimals; applications involving ratio, proportion, and percent; factoring algebraic expressions; operations with polynomials; properties of exponents; solutions of linear equations and inequalities; operations with radical expressions; solution of quadratic equations and inequalities; graphing in the coordinate plane; and solution of systems of equations. While the Math Center is an excellent resource, several credit courses are available to assist in this review.

The Learning Center is available at University Park and most other campuses to offer assistance in the basic skill areas of writing, reading, and mathematics. This facility and its resources are open to any student who needs or wants such help. Most centers also provide help to develop and refine study skills, and most offer subject-area tutoring in entry-level college courses.

DIVISION OF UNDERGRADUATE STUDIES—This division is an academic unit of the University that offers at the Commonwealth Campuses, Penn State Erie, The Behrend College, and the University Park Campus the following programs and services:

Freshman Testing, Counseling, and Advising Program—All new freshmen admitted to the University are provided with comprehensive testing and academic advising prior to attending first-semester classes. The purpose of the program is to provide all new students with assistance in evaluating their educational plans and objectives.

Enrollment Program—New freshmen who prefer to test their abilities and interests or who want to explore several areas of study before identifying themselves with one of the University's colleges may begin their enrollment in the Division of Undergraduate Studies. At any time in their academic careers, students whose interests or career objectives change can request enrollment in DUS (Division of Undergraduate Studies) until the time that they choose a new program and meet its academic standards for transfer.

Academic Advising Program—All students, whether or not they are enrolled in the Division of Undergraduate Studies, have available to them the professional advising, educational planning, and referral services provided by DUS. Such services are a supplement to and are coordinated with the advisory services of the colleges and faculty. Provisional students are also advised by DUS.

Academic Information Program—The Division of Undergraduate Studies provides a comprehensive academic information support system throughout the University to assist faculty in their student advisory responsibilities. DUS academic advising and information centers are located at every Commonwealth Campus and in the colleges and other degree-granting units at University Park.

GRADING SYSTEM—The grades of A, B, C, D, and F indicate the following qualities of academic performance:

- A (EXCELLENT) Indicates exceptional achievement.
- B (GOOD) Indicates extensive achievement.
- C (SATISFACTORY) Indicates acceptable achievement.
- D (POOR) Indicates only minimal achievement. It indicates that the student may be seriously handicapped in carrying a more advanced course for which this course is a specific prerequisite.
- F (FAILURE) Indicates inadequate achievement necessitating a repetition of the course in order to secure credit.

The grades of A, A-, B+, B, B-, C+, C, D, and F indicate a gradation in quality from Excellent to

Failure and are assigned the following grade-point equivalents:

| <i>Grade</i> | <i>Grade-Point Equivalent</i> |
|--------------|-------------------------------|
| A | 4.00 |
| A- | 3.67 |
| B+ | 3.33 |
| B | 3.00 |
| B- | 2.67 |
| C+ | 2.33 |
| C | 2.00 |
| D | 1.00 |
| F | 0 |

Grade points are determined by multiplying the grade-point equivalent of the grade earned by the number of credits for the subject; e.g., ENGL 015, 3 credits, with a grade of A (grade-point equivalent 4.00) yields 12 grade points.

GRADUATION REQUIREMENTS—In order to graduate, a student must complete the course requirements of the major and earn at least a C average (a grade-point average of 2.00) for all courses.

DEGREES—The associate degree majors outlined in this bulletin lead to the following degrees: Associate in Arts, Associate in Engineering Technology, and Associate in Science.

SECONDARY SCHOOL UNITS REQUIRED FOR ADMISSION
CONSIDERATION FOR ASSOCIATE DEGREE PROGRAMS
(Effective Summer 1989)

| | English | Math. (C)* | Math. (D)+ | Math. (E)** | Science | Arts/Humanities/ Social Studies and Foreign Languages |
|---|---------|------------|------------|-------------|---------|---|
| TWO-YEAR DEGREE APPLICANTS | | | | | | |
| Agricultural Business | 4 | | | 2 | 2 | 5 |
| Architectural Engineering Technology | 4 | 2 | | | 2 | 5 |
| Biomedical Equipment Technology | 4 | 2 | | | 2 | 5 |
| Building Energy Systems Technology | 4 | | 2 | | 2 | 5 |
| Business Administration (2-year) | 4 | | | 2 | 2 | 5 |
| Chemical Engineering Technology | 3 | 2 | | | | 10 |
| Computer Science (2-year) | 4 | 2 | | | 2 | 5 |
| Dietetic Food Systems Management | 4 | | | 2 | 2 | 5 |
| Electrical Engineering Technology | 4 | 2 | | | 2 | 5 |
| Forest Technology | 4 | | 2 | | 2 | 5 |
| Highway Engineering Technology | 3 | 2 | | | | 10 |
| Hotel, Restaurant, and Institutional Management (2-year) | 4 | | | 2 | 2 | 5 |
| Individual and Family Studies and Services | 4 | | | 2 | 2 | 5 |
| Letters, Arts, and Sciences | 4 | | | 2 | 2 | 5 |
| Materials Engineering Technology | 4 | 2 | | | 2 | 5 |
| Mechanical Engineering Technology | 4 | 2 | | | 2 | 5 |
| Medical Laboratory Technology | 4 | 2 | | | 2++ | 5 |
| Microcomputer Engineering Technology | 4 | 2 | | | 2 | 5 |
| Nuclear Engineering Technology | 4 | 2 | | | 2 | 5 |
| Physical Therapist Assistance | 4 | | 2 | | 2# | 5 |
| Railway Engineering Technology | 3 | 2 | | | | 10 |
| Science (2-year) (including Radiologic Technologist Option) | 4 | 2 | | 2 | 2 | 5 |
| Sociology | 4 | | | 2 | 2 | 5 |
| Surveying Technology | 4 | 2 | | | 2 | 5 |
| Telecommunications Technology | 4 | 2 | | | 2 | 5 |
| Wildlife Technology | 4 | | 2 | | 2 | 5 |

* Math. (C) requirements may be satisfied by 2 units of mathematics, including 1 unit of algebra and 1 additional unit of advanced algebra, plane geometry, solid geometry, or trigonometry.

+ Math (D) requirements may be satisfied by 2 units of mathematics: 1 unit of algebra and 1 additional unit of mathematics. Plane geometry is recommended.

** Math. (E) requirements may be satisfied by any 2 units of mathematics.

++ Students entering Medical Laboratory Technology should have 1 unit each in biology and chemistry.

Those entering Physical Therapist Assistance should have 1 unit in biology plus one other science course.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT THE UNIVERSITY PARK CAMPUS—Credits received for associate degree program courses may be applicable to a particular baccalaureate degree program listed in the current *Penn State Baccalaureate Degree Programs Bulletin* at the discretion of the appropriate college and major department.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT PENN STATE HARRISBURG—In addition to receiving an education to prepare for employment, the graduate of an associate degree program may also qualify for admission to various programs leading to a baccalaureate degree from Penn State Harrisburg. Those anticipating admission to Penn State Harrisburg should inquire at that college's Admissions Office late in their freshman year or early in their sophomore year concerning baccalaureate degree course requirements.

Graduates from associate degree programs in Business Administration or Computer Science may want to consider further study at Penn State Harrisburg in a Business Administration baccalaureate degree program.

Graduates of the associate degree majors in Architectural Engineering Technology, Biomedical Equipment Technology, Building Energy Systems Technology, Chemical Engineering Technology, Electrical Engineering Technology, Materials Engineering Technology, Mechanical Engineering Technology, Mining Technology, Nuclear Engineering Technology, Railway Engineering Technology, Surveying Technology, and Telecommunications Technology may want to consider continuing at Penn State Harrisburg in an engineering technology major leading to a bachelor of science degree in engineering technology. Majors are offered in Electrical Engineering Technology, Energy Technology, Environmental Engineering Technology, Mechanical Engineering Technology, and Structural Design and Construction Engineering Technology.

Associate degrees in the following majors are also acceptable toward admission to baccalaureate degree majors at Penn State Harrisburg: Forest Technology; Hotel, Restaurant, and Institutional Management; Labor Studies; Letters, Arts, and Sciences; Medical Laboratory Technology; Microcomputer Engineering Technology; and Sociology. Penn State Harrisburg programs related to these majors are offered by the college's Division of Humanities, Division of Behavioral Science and Education, and Division of Public Affairs.

Graduates of the associate degree majors in Science and in Computer Science may want to consider admission to the baccalaureate degree major in Mathematical Sciences at Penn State Harrisburg.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT PENN STATE ERIE, THE BEHREND COLLEGE—Graduates of associate degree majors may also qualify for admission to a variety of baccalaureate degree majors at Penn State-Behrend. Students interested in applying to Penn State-Behrend should contact that college's Admissions Office or talk with Penn State-Behrend's dean's representative at their campus.

Graduates of associate degree majors in either Business Administration or Computer Science may want to continue study in one of the following baccalaureate degree majors at Penn State-Behrend: Accounting, Business Economics, General Business, Management, or Management Information Systems. Students graduating with a two-year degree in Letters, Arts, and Sciences may want to consider any of a large number of majors offered by Penn State-Behrend in the liberal arts, sciences, and business.

Graduates of associate degree majors in Biomedical Equipment Technology, Electrical Engineering Technology, Microcomputer Engineering Technology, and Telecommunications Technology may want to continue their education in the baccalaureate degree major in Electrical Engineering Technology. Students receiving an Associate in Engineering Technology degree in Mechanical Engineering Technology may want to continue study in a baccalaureate degree major in either Mechanical or Plastics Engineering Technology.

GENERAL INFORMATION

EXTENDED BACCALAUREATE DEGREE PROGRAMS—Graduates of associate degree majors also may qualify for admission to one of the extended baccalaureate degree programs offered at the following Penn State campuses: B.S. in Administration of Justice at Fayette Campus; B.S. in Electrical Engineering Technology at Berks Campus; B.A. in General Arts and Sciences at Altoona, Beaver, DuBois, Fayette, McKeesport, New Kensington, and Shenango Valley Campuses; B.S. in Engineering Technology at New Kensington and Wilkes-Barre Campuses; and B.S. in Nursing at Beaver, Berks, Delaware County, Fayette, McKeesport, New Kensington, Ogontz, and Shenango Valley Campuses and at Hershey. For more information, contact the Admissions Office at the campus offering the program.

STUDENT WELFARE

STUDENT GOVERNMENT—Representative student leadership is provided on each campus of the University by a student government association that functions through officers and representatives elected from and by the student body. In addition to their involvement in student programs at their local campuses, student officers and delegates from University campuses convene several times annually. These meetings provide for an exchange of information among the various student government associations and for systemwide coordination in student government and student activities.

STUDENT CONDUCT—The Code of Conduct prohibits acts that interfere with the basic purposes or processes of the University, or with the rights, health, and safety of its members. Such acts include, but are not limited to, academic dishonesty, unethical and destructive behavior, and violation of rules and regulations. Violations of the code are subject to disciplinary action that may include separation from the University. Students, faculty, or staff may file complaints regarding student violations of the Code of Conduct with the Office of Conduct Standards at any University location.

INSURANCE PROTECTION WHILE ATTENDING THE UNIVERSITY—Any student who wants insurance protection while in attendance at the University (1) for accident and health and/or (2) for loss of property by fire or theft should arrange personally for whatever insurance seems desirable through any agency of his or her choice. Accident and health programs are available through the University Health Service.

HEALTH SERVICES—The University Health Service assists in promoting and maintaining the health of students.

Prior to their initial registration, all new full-time students entering the University must submit a medical history on a special form provided by the University. The completed form constitutes a vital part of the student's medical record.

The health services of the University are made available to students in accordance with a statement provided by each campus, pertinent to that campus, and published in its student handbook.

The University does not obligate itself for payment of medical services other than those provided by personnel employed or retained by the University and in facilities owned or contracted for by the University. Treatment provided in contract facilities must be authorized by the campus executive officer, the director of student programs and services, or the nurse.

Students are urged to protect themselves against medical expenses that may result from injury or illness by arranging for personal insurance coverage. An accident and sickness plan is available to all undergraduate students at a reasonable charge through the University Health Service.

DISABLED STUDENT SERVICES—Penn State encourages academically qualified disabled students to take advantage of its educational programs. It is the policy of the University not to discriminate against persons with disabilities in its admission policies or procedures or its educational programs, services, and activities.

The University is responsible for making all of its programs and services available to all its students. In cases where it is necessary to provide auxiliary services and programs to meet the specific needs of disabled students, it is the responsibility of the coordinator of the Office for Disability Services to make reasonable accommodations. Examples of such accommodations available to those with special needs are sign language interpreters, accessible University transportation, and classroom and library assistance. Students anticipating the need for special services, both before and after enrollment, are encouraged to contact the coordinator of the Office for Disability Services at University Park (105 Boucke Building) or the director of student programs and services at other campuses.

CAREER DEVELOPMENT AND PLACEMENT—Career Development and Placement Services assists students in continual evaluation of their educational and career plans as they progress through college and helps them identify sources of personal or academic difficulty that may interfere with their progress. Individual as well as group educational and career counseling programs are available to students. A computerized guidance system, DISCOVER, is available for student use at each campus location.

A Student Programs and Services staff member at each campus is responsible for providing placement assistance for associate degree graduates. Services include inviting employers to the campus to interview graduates for permanent employment, providing job information, and assisting students in preparing for the job search process. Career Development and Placement Services at the University Park Campus supplies prospective employers (national, state, and local) with information concerning the associate degree programs and works cooperatively with the Commonwealth Campuses in assisting graduates to locate suitable employment.

STUDENT AID

In addition to the student aid information provided below, students may want to consult the admissions booklets sent to all applicants and the "Penn State Student Aid" brochure, available upon request. Additional questions should be directed to the Office of Student Aid, 335 Boucke Building on the University Park Campus, or to the Office of Student Programs and Services at other Penn State campuses.

AID PROGRAMS AVAILABLE TO ASSOCIATE DEGREE CANDIDATES

GRANTS (aid sources not requiring repayment)

Pell Grant—The Pell Grant is the major federal grant program available to undergraduates. This award is available to undergraduates pursuing their first baccalaureate or associate degree on at least a half-time basis (6 credits per semester).

Pennsylvania Higher Education Assistance Agency Grant (PHEAA)—This is a grant established by the Commonwealth to assist undergraduates who have a financial need as defined by PHEAA guidelines. Applicants must be residents of Pennsylvania and enrolled full-time.

GENERAL INFORMATION

Note: Non-Pennsylvania students should contact their state higher education assistance agencies for information on state grants available for attending Penn State. Names and addresses of higher education assistance agencies are available from the Office of Student Aid at University Park Campus or the Office of Student Programs and Services at other Penn State campuses.

Supplemental Educational Opportunity Grant (SEOG)—This grant is available to undergraduates with documented high financial need. It is normally awarded in combination with the College Work Study Program or the Perkins Loan (formerly NDSL). Priority is given to students who appear to be eligible for the Pell Grant.

Penn State Academic Grant—This grant is awarded to students demonstrating academic excellence and high financial need. Students completing the application process for campus-based aid (Perkins Loan, SEOG, CWSP) will be automatically considered for this grant.

LOANS

Stafford Loan Program (formerly GSL)—The Stafford Loan is a federally subsidized loan program, available through banks, savings and loan associations, and other private lenders, which offers students attending on at least a half-time basis the opportunity to borrow money for their education. An undergraduate may borrow up to \$2,625 per year with a maximum of \$17,250 for undergraduate studies. Applications for Stafford Loans are evaluated based on financial need; therefore, all students applying for a Stafford Loan must complete an appropriate need analysis document. Pennsylvanians may file the Pennsylvania State Grant and Federal Student Aid application while non-Pennsylvanians may file the Financial Aid form. Six months after the termination of the student's education, repayment begins at an interest rate of 8 percent per year for the first four years of repayment, then 10 percent through completion of repayment.

PLUS Loan—This is an educational loan available to parents of dependent undergraduate students. Similar to the Stafford Loan program, funds are provided by private lenders such as hometown banks, etc. The interest rate is 10.27 percent and the maximum dollar amount that can be borrowed per grade level is \$4,000. Repayment of the loan begins within sixty days. Student borrowers may defer payment of principal until six months after termination of studies.

PHEAA Higher Education Loan Plan (HELP)—This plan may involve one or more loan programs. It combines the PHEAA nonsubsidized loan and the new PHEAA Alternative Loans with the federally subsidized student loan programs. Families can borrow the amount needed at the lowest cost, up to \$10,000 per year. Interest rates range between 8 and 9.5 percent annually, depending on the loan package selected. Applications are available from hometown lenders or directly from PHEAA. Non-Pennsylvanians can obtain applications from the Office of Student Aid at University Park.

Perkins Loan (formerly NSDL)—This program provides loans of up to \$1,500 per year with an overall maximum of \$9,000 for undergraduate students with documented financial need. Nine months after termination of the student's education, repayment starts at an interest rate of 5 percent per year simple interest. Postponement of repayment and loan cancellation may be arranged for certain types of employment following graduation.

University Loans—University loans are funds established by donors to help students who have a documented financial need. These loans help needy students meet the educational and living expenses required to attain a college degree. Repayment at a simple interest rate of 6 percent per year starts immediately after the student completes his or her studies.

EMPLOYMENT

College Work Study Program (CWSP)—The CWSP is a form of federal aid that allows a student to

earn a portion of the documented financial need through approved CWSP jobs. This is a nonrepayable source of aid since the student is paid an hourly wage for his or her employment.

Student Employment—Students who are interested in part-time employment on campus or in the State College area should contact the Student Employment Office at the University Park Campus, or contact the Office of Student Programs and Services at other Penn State campuses.

SCHOLARSHIPS

University Scholarships—University scholarships are awarded on the basis of superior high school or college academic performance and, in most cases, documented financial need. They are awarded either by the scholarship committees in the various academic colleges of Penn State, by the Freshman or Faculty Senate Scholarship Committee, or by the Commonwealth Campus Scholarship Committees.

HOW TO APPLY

After completing the application for admission to the University, each student seeking aid consideration should complete the forms necessary for each aid program being sought.

I. Aid Awarded by the Federal Government

Pell Grant

(All undergraduate students)

Students who have completed the application for Pennsylvania State Grant and Federal Student Aid or the Financial Aid Form (FAF) are considered for the Pell Grant program. After receiving the Student Aid Report (SAR), which designates eligibility for a Pell Grant, follow the instructions contained on the SAR to finalize the award. Applications are available from high school guidance counselors, the Office of Student Aid at University Park, or the Office of Student Programs and Services at other Penn State Campuses. They should be completed as soon after January 1 as possible. Transfer students must request a Financial Aid Transcript to be sent to the Office of Student Aid, 335 Boucke Building, University Park, PA 16802, from each institution previously attended whether or not aid was received.

II. Aid Awarded/Coordinated by the States

PHEAA Grant (Pennsylvania residents only)

Other state grant/scholarship programs

Stafford Loan, formerly Guaranteed Student Loan (GSL)

PLUS Loan

PHEAA HELP (Higher Education Loan Plan)

(Undergraduates)

Pennsylvania residents should complete the application for Pennsylvania State Grant and Federal Student Aid. Students currently receiving PHEAA grants will receive renewal applications by mail from the PHEAA agency. Regular applications are available from high school guidance counselors, the Office of Student Aid at University Park, and the Office of Student Programs and Services at other Penn State campuses, in addition to the Pennsylvania Higher Education Assistance Agency. Applications should be completed as soon after January 1 as possible. Non-Pennsylvania students should contact their state's Higher Education Agency for information on aid programs available to them as Penn State students.

GENERAL INFORMATION

(PA and non-PA residents)

Contact a local bank or lending institution for application forms for the Stafford Loan program and the PLUS Loan. Applications for PHEAA HELP are available by contacting the Office of Student Aid at University Park or PHEAA directly. Non-Pennsylvanians may obtain applications from the Office of Student Aid, 335 Boucke Building, The Pennsylvania State University, University Park, PA 16802. Students should allow six to eight weeks for the processing of their loan application.

III. Aid Awarded by The Pennsylvania State University

Supplemental Educational Opportunity Grant (SEOG)
Perkins Loan, National Direct Student Loan (NDSL)
College Work Study Program (CWSP)
University loans and scholarships

(All students)

Complete the application for Pennsylvania State Grant and Federal Aid or the Financial Aid Form (FAF).

Note: Freshman students need only complete one of the above forms to be considered for aid awarded by Penn State. Both forms are available from high school guidance counselors, the Office of Student Aid at University Park, or the Office of Student Programs and Services at other Penn State campuses. The recommended filing date for consideration for aid is February 15; however, students are encouraged to submit applications as soon after January 1 as possible.

(All students except entering freshmen)

Complete the Office of Student Aid's Financial Aid Application. Students may indicate on this application the type of aid they are seeking, with the exception of University scholarships. File by April 1. The application is available from the Office of Student Aid at University Park or the Director of Student Programs and Services at other Penn State campuses.

(Transfer students only)

Complete a Financial Aid Transcript. It is necessary for the University to know if you received aid at any other institution prior to enrolling at Penn State. Request this form from the Office of Student Aid. A Financial Aid Transcript must be submitted from all schools previously attended whether or not aid was received.

IV. Private Aid Sources

All students are urged to explore local scholarship/grant opportunities as well as any private low-interest loan funds offered by local employers and civic organizations.

HOW MUCH DOES IT COST TO ATTEND PENN STATE?

One of the major concerns of students and their parents is knowing how much it will cost to attend Penn State for an academic year. The following itemized listings of expenses, although prepared for the 1988-89 academic year, may be used as a basic guide for your planning. Students may find that some of the costs vary according to individual needs and circumstances.

STUDENT BUDGET—1988–89

| | <i>Residence Halls or Off-Campus Housing (All Campuses)</i> | <i>Living at Home</i> |
|--|---|-------------------------------|
| Commonwealth Campus Tuition | \$3,494* | \$3,494* |
| Room & Board | 3,170 | 1,500 |
| Books & Supplies | 400 | 400 |
| Clothing & Laundry Transportation, Personal Maintenance, Medical, & Recreation | 1,962 | 2,430 |
| Total* | \$9,026 | \$7,824 |

*For non-Pennsylvania residents, the nonresident undergraduate tuition figure of \$7,248 should be substituted. The total estimated budget for an out-of-state undergraduate student at the University Park Campus or a Commonwealth Campus is \$12,780.

For Pennsylvania residents, the 1988–89 undergraduate tuition at the University Park Campus, Penn State Erie, The Behrend College, and Penn State Harrisburg is \$3,610.

STUDENT AID POLICIES

The Office of Student Aid at Penn State administers and coordinates the aid programs according to applicable federal and state regulations and University policies that guarantee each student equal access to financial assistance. The Office of Student Aid employs the standard need analysis services of the College Scholarship Service and the Pennsylvania Higher Education Assistance Agency to assess the aid eligibility of student applicants, ensuring equity of treatment among all applicants.

Eligibility for aid is contingent upon the student's financial need for assistance to meet educational costs. Each program has specific eligibility requirements that must be met before funds are awarded. In addition to financial need as a criterion for receiving aid, a student must be enrolling as a degree or provisional student. Nondegree students are not eligible to receive aid at Penn State. The University may require an official copy of the Federal Income Tax Form 1040 to verify eligibility for aid.

The Office of Student Aid assumes that all aid applicants will keep apprised of all application deadlines pertaining to the aid sources they are seeking. Because limited funds are available, applications filed after the applicable deadline dates are considered only as funds permit. On-time applicants receive first consideration. Some aid programs have flexible application deadlines that permit students to receive consideration at most times during the year (for example, the Stafford Loan and Pell Grant programs). Current and prospective aid recipients are strongly encouraged to keep well informed of aid application procedures through aid publications, news media, and agencies providing aid information such as the Office of Student Aid at University Park and the Office of Student Programs and Services at other Penn State campuses.

Aid is never automatically awarded for subsequent years. Students must reapply each year for funds. Students who plan to attend the summer session must file separate applications to be considered for almost all aid programs. The major exceptions to this requirement are as follows:

1. Entering freshmen seeking aid awarded by the University (see "How to Apply," above) must file only the application for Pennsylvania State Grant and Federal Student Aid or the FAF to receive consideration for the summer session if they have been admitted to the University specifically to begin during the summer session; and
2. The Pell Grant program has no separate summer application and is generally awarded to students during the fall–spring academic year. (Pell Grant recipients not attending the entire fall–spring year should contact the Office of Student Aid to determine if a summer payment is possible.)

GENERAL INFORMATION

One of the goals of the Office of Student Aid is to help student aid recipients receive a student aid package that will attempt to meet the student's documented financial need. The student aid package can be composed of federal aid, state grant monies, private award sources, or any other source of funds available to the student, including earnings from University employment.

It is the responsibility of the Office of Student Aid, however, to assure the federal government that federal aid recipients will not be permitted to retain financial aid *exceeding* their needs. Students should be aware that if the aid received is in excess of need, they will be notified of their responsibility to return the excess amount to the University.

FEDERAL STUDENT ASSISTANCE SATISFACTORY ACADEMIC PROGRESS STANDARD

Satisfactory academic progress must be maintained for continued consideration for federal financial assistance at Penn State. Students must comply with the following to ensure continued consideration:

1. Minimum standards for satisfactory scholarship established by Senate Policy Section 54-54 of the *Academic Policies and Procedures for Undergraduate Students*, published in the *Policies and Rules for Students*.
2. Associate degree candidates must complete a minimum of 26 credits per academic level.
3. Students falling below this minimum by no more than 10 credits will be granted one probationary period (two semesters) to attain the minimum earned credit requirement while retaining aid eligibility.
4. When a student falls below this probationary level, the student becomes ineligible for aid.
5. While ineligible, federal aid is denied until the appropriate credit expectation has been reached for the next academic year.
6. Complete the requirements for the associate degree within six semesters.

Exceptions to the above and information concerning reinstatement of aid, course audits, deferred grades, and course repeats can be obtained by contacting the Office of Student Aid, 335 Boucke Building, The Pennsylvania State University, University Park, PA 16802. Copies of the Federal Student Assistance Satisfactory Academic Progress Standard are available from the Office of Student Aid at University Park or the Office of Student Programs and Services at other Penn State campuses.

SELECTIVE SERVICE REGISTRATION COMPLIANCE

Educational institutions are now required by law to collect a Statement of Registration Compliance from every federal student aid recipient whether male or female. This attests to their status with the Selective Service. Disbursement of federal student aid funds cannot occur until the Statement of Registration Compliance is on file with the Office of Student Aid. This requirement applies to Perkins Loan (NDSL), SEOG, CWSP, Pell, Stafford Loan (GSL), and PLUS/SLS programs.

DEFAULT STATEMENT

Educational institutions also are required by law to collect a Default Statement from every federal student aid recipient. This certifies that the student is not in default on any loan made under the Stafford Loan (GSL), PLUS/SLS, Consolidation, Income Contingent, or Perkins Loan (NDSL) programs and that he/she does not owe a refund on a grant received under the Pell Grant, SEOG, SSIG, or Byrd Scholarship programs. Disbursement of federal aid funds cannot occur until the Default Statement is on file with the Office of Student Aid. This requirement applies to the Perkins Loan (NDSL), SEOG, CWSP, Pell, Stafford Loan (GSL), and PLUS/SLS programs.

ESTIMATED TUITION, ROOM, BOARD, AND OTHER CHARGES

NOTE: The University reserves the right to revise tuition, room, board, and other charges without further notice. Tuition and charges for baccalaureate and graduate programs are listed separately in the *Baccalaureate Degree Programs*, *Graduate Degree Programs*, and *Penn State Harrisburg Bulletins*. Penn State has two semesters and a summer session. Students normally attend two semesters per year. The tuition and charges set forth below are for the 1988–89 academic year. The actual tuition and charges for the 1989–90 academic year will be established prior to the beginning of the fall semester of the academic year.

TUITION—Tuition per semester for associate degree students in 1988–89.

| | <i>Pennsylvanians</i> | <i>Non-Pennsylvanians</i> |
|--|-----------------------|---------------------------|
| 12 or more credits: | | |
| University Park Campus | \$1,805 | \$3,624 |
| Commonwealth Campuses | 1,747 | 3,624 |
| Penn State-Behrend | 1,805 | 3,624 |
| 11 or fewer credits: | | |
| University Park Campus—rate per credit | 150 | 303 |
| Commonwealth Campuses—rate per credit | 140 | 303 |
| Penn State-Behrend—rate per credit | 150 | 303 |

Enrollment Charge—All entering students who plan to enroll for 12 or more credits are required to pay a nonrefundable enrollment charge of \$75 upon acceptance of an offer of admission.

General Deposit—Undergraduate students are required to make a general deposit of \$50 at the time of admission. This deposit will serve to safeguard the property and equipment used by students in their course of study. It will be retained until a student withdraws or is graduated.

The deposit, less any charges for equipment damages, losses, and forfeitures, will be refunded early in the subsequent semester to the student who has withdrawn or been graduated. The refund will be made by check and mailed to the student's home address. If at any time the balance of the deposit falls below the minimum amount of \$15, the deposit must be replenished.

Credit by Examination—A charge of \$30 per credit is made for credit by examination. For evaluation of credits completed elsewhere, a charge of \$35 is made for those applying for admission and a charge of \$3 for those who are already matriculated.

Student Activities—Student activities charges are determined by elected representatives of the student body, together with a faculty representative.

Certification and Verification Fee—A charge of \$3 is made for each request for verification or certification of enrollment.

Change of Schedule Charge—Unless a change is necessitated by the University, a charge of \$6 is made for each change of schedule after the first five working days of a semester.

Late Registration Charge—Unless the delay is unavoidable, \$10 is charged a student who fails to register on the appointed day.

Other Expenses—Books and supplies must be secured by the student. These vary from approximately \$125 per semester, depending upon the program.

TERMS OF PAYMENT—Tuition and charges, including room and board, are due and payable in advance of each semester at the Office of the Bursar, 103 Shields Building, The Pennsylvania State University, University Park, PA 16802. Registration for courses is not complete until an estimated bill is processed.

GENERAL INFORMATION

Approximately six weeks in advance of each semester, the University will mail to each continuing and newly admitted degree student of record an estimated bill for tuition and, where applicable, residence hall charges. Payment by mail is encouraged before the established deadline. The receipt is returned to the student by mail. If checks tendered for payment of tuition and charges are not paid upon presentation to the maker's bank, the student will automatically incur the late payment fee of \$25, and the receipt previously mailed will be considered null and void.

Any student who does not fulfill payment of obligations by the deadline established may be charged the late payment fee of \$25. This charge for late payment also applies to unpaid student supplemental charges. Students whose accounts are delinquent for more than ten days are subject to suspension from the University.

The University reserves the right to withhold transcripts and services to any current or former student who has an unsatisfied financial obligation to the University.

WITHDRAWALS, COURSE DROPS, AND REFUNDS—Refunds of tuition for withdrawals are based on the date of last class attended.

Charges for tuition are refundable upon withdrawal from the University only in the event the student obtains an official withdrawal form at the office of the dean of his or her college or other degree-granting unit and presents it at the Office of the Registrar not later than one calendar month after the date of last class attended.

In the event of withdrawal, charges for tuition will be refunded under the following policy:

Refund of 80 percent upon withdrawal before the end of the first week of the semester (seventh consecutive calendar day from the first day of classes) and a decrease of 10 percent for each week thereafter up to and including the eighth consecutive calendar week. No amount will be refunded for withdrawal after the eighth consecutive calendar week of the semester.

If a student is enrolled for 12 or fewer credits and drops 1 or more credits, refunds will be determined on the effective date of the drop using the same refund percentage listed above under withdrawal.

For refund information for courses other than those taken for fifteen weeks, contact the fee assessor in 109 Shields Building, The Pennsylvania State University, University Park, PA 16802.

Any refund policy related to adjustments in room and board will be a part of the housing contract.

Deposits or deposit balances, and credit balances on student accounts will be refunded to the student early in the semester following the student's withdrawal or graduation. The refund will be made by check and mailed to the student's home address that is currently on file with the University. All financial obligations of every kind, whether matured or unmatured, due and owing to the University must be completely settled before any refund is issued.

If, due to incorrect student address information, the University's attempt to forward a refund fails, the University will retain the deposit and/or the student account credit balance for one year. After one year, the refund amount will become a general gift to the University.

PENNSYLVANIA RESIDENCE

The policy for determination of a student's Pennsylvania resident status is as follows:

A. *Pennsylvania Classification*—A student shall be classified as a Pennsylvania resident for tuition purposes if that student has resided in the Commonwealth for at least one calendar year before enrolling at The Pennsylvania State University.

1. A student who does not have continuous residence in Pennsylvania for a period of twelve months immediately preceding enrollment at The Pennsylvania State University is presumed to be a non-Pennsylvanian for tuition purposes.
2. A student attempting to obtain classification as a Pennsylvania resident for tuition purposes must be a citizen of the United States or must have indicated by formal action his/her intention to become a citizen or must have been admitted to the United States on an immigrant visa. A student admitted to the United States on a tourist or student (nonimmigrant) visa is not eligible for classification as a Pennsylvania resident for tuition purposes.
3. A student under the age of twenty-one is presumed to have the residence of his/her parent(s) or legal guardian.
4. A United States government employee or member of the armed forces who was a resident of Pennsylvania immediately preceding his/her entry into government service and who has continuously maintained Pennsylvania as his/her legal residence will be presumed to be a Pennsylvania resident.

5. A student receiving a scholarship, guaranteed loan, grant, or other form of financial assistance dependent upon residence in a state other than Pennsylvania is not a Pennsylvania resident for tuition purposes.

B. *Reclassification of Residency*—A student requesting reclassification as a Pennsylvania resident for tuition purposes must demonstrate by clear and convincing evidence that his/her permanent residence is in Pennsylvania. Each case shall be decided individually on the basis of all facts submitted by the petitioner. While it is not possible to require a given number of factors or a specific set of circumstances, the following may be considered convincing evidence when presented by those petitioning for reclassification as Pennsylvania residents for tuition purposes.

1. Purchase of a permanent, independent residence. This must be the principal residence of the student and/or his/her parent(s) or guardian.
2. Payment of applicable state and local taxes on income earned either as a resident or outside the Commonwealth and the filing of appropriate returns for such taxes.
3. Financial self-support and emancipation: Students who claim financial self-support or emancipation should provide the following evidence to support their claim:
 - a. Complete financial disclosure with appropriate evidence to indicate sufficient income to provide minimum funds for tuition, living, and related expenses as determined by the University's Office of Student Aid.
 - b. Copy of latest Pennsylvania and federal personal income tax returns.
 - c. Sworn statement from parent(s) or legal guardian that the student will not be claimed as a dependent on current or future federal income tax returns.
4. Presentation of clear and convincing evidence that although the parent(s) or guardian on whom the student is dependent resides or has moved outside the Commonwealth, the student has maintained continuous residence in the Commonwealth for a period of at least one year prior to enrolling at the University and continues to maintain such separate residence.
5. The student may submit evidence of any other facts believed to be relevant to the reclassification request, such as evidence of full-time employment in Pennsylvania or registration to vote.

C. *Reclassification Procedure*

1. A student may challenge his/her residence classification by filing a written petition with the person or committee designated to consider such challenges at the University. Such person or committee shall consider such petition and render a timely decision. A decision by the highest designated authority at the University shall constitute an exhaustion of administrative remedies.
2. Any reclassification resulting from a student's challenge or appeal shall be effective at the beginning of the semester or session during which the challenge or appeal was filed or at the beginning of the following semester or session. The decision as to which semester or session becomes the effective date shall rest with the person or committee rendering the decision on reclassification.
3. A student who changes his/her place of residence from Pennsylvania to another state is required to give prompt written notice of this change to the University and shall be reclassified as a non-Pennsylvanian for tuition purposes effective with the date of such change.
4. A dependent resident student whose parent(s) or guardian(s) move outside of the Commonwealth may remain a Pennsylvania resident for tuition purposes if he/she continues to maintain a separate residence within the Commonwealth.

NONRESIDENT STUDENT CLASSIFICATION

A. A student is initially classified as a nonresident based on information provided by the student when applying for admission to the University. The initial classification is made as follows:

1. Undergraduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Academic Services Officer
 - b. All other locations—Undergraduate Admissions Office, The Pennsylvania State University, University Park, PA 16802.

GENERAL INFORMATION

2. Graduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Academic Services Officer
 - b. All other locations—Dean of the Graduate School
 3. Medical Student The Milton S. Hershey Medical Center—Office of Student Affairs, The Milton S. Hershey Medical Center
- B. A student may challenge his/her residency classification by filing a written petition as follows:
1. Undergraduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Financial Officer
 - b. All other locations—Fee Assessor
 2. Graduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Financial Officer
 - b. All other locations—Fee Assessor
 3. Medical Student The Milton S. Hershey Medical Center—Controller, The Milton S. Hershey Medical Center
- C. The appropriate University official reviews the student's petition and makes a residency decision.
- D. The student may appeal that officer's residency decision to the University Appeals Committee on Residence Classification having representation from the Assistant Controller's Office, Undergraduate Admissions Office, and Graduate School. The committee's decision on appeal shall be final.

MAJORS

GENERAL EDUCATION

The University Faculty Senate, at its meeting on April 30, 1985, adopted the following statement as a comprehensive definition of general education:

General Education is the breadth of knowledge involving the major intellectual and aesthetic achievements of humanity. This must include understanding and appreciation of the pluralistic nature of knowledge epitomized by the natural sciences, mathematics, social-behavioral sciences, humanities, and the arts. General Education aids students in developing intellectual curiosity, strengthened ability to think, and a deeper sense of aesthetic appreciation. General Education, in essence, aims to cultivate a knowledgeable, informed, literate human being.

An effective General Education program enables students to:

1. acquire knowledge through critical reading and listening;
2. analyze and evaluate, where appropriate in a quantitative manner, the acquired knowledge;
3. integrate knowledge from a variety of sources and fields;
4. make critical judgments in a logical and rational manner;
5. recognize and comprehend the role of physical activity in meeting the demands of daily living;
6. learn to communicate effectively;
7. comprehend the reality of international interdependence and cultural diversity;
8. comprehend the role of aesthetic and creative activities in meeting the demands of daily living.

Courses taken to meet General Education program requirements may not be taken under the Satisfactory-Unsatisfactory option.

The General Education program for Penn State associate degree students consists of 21 credits distributed among communication and quantification skills (6 credits), the distribution areas (12 credits), including breadth and depth courses in the natural sciences (3 credits), arts (3 credits), humanities (3 credits), and social and behavioral sciences (3 credits), and an additional 3 credits in any General Education area.

Opportunities for qualified students to substitute advanced courses for courses on the breadth and depth lists are indicated below.

A. Breadth Courses

Breadth courses introduce and integrate major areas of knowledge, presenting the most fundamental and universal concepts, issues, and achievements in the discipline or cluster of disciplines. They represent the offering unit's special effort to help a wide range of students obtain coherent overviews of major findings and modes of investigation. While each breadth course stimulates further interest in the discipline(s), it may be, for many students, the only course taken in the discipline(s). Each breadth course, therefore, develops for such students a substantial, nonspecialized appreciation for the primary ways in which the discipline or cluster of disciplines contributes to a useful understanding of the human condition and/or its environment.

1. *Natural sciences breadth courses* emphasize the order, diversity, and beauty of nature, the concepts in the disciplines most useful to an informed citizenry, and how scientific understanding can bear on the formulation of individual and social values. The courses promote understanding of the inductive and deductive reasoning processes and develop a student's ability to reason inductively and deductively.

Scientific and technical disciplines require more advanced courses in basic sciences as essential foundations for further study in a range of majors. Such courses, which assume an already developed sense of the "general" aspects of the field, may be substituted for natural sciences breadth courses in any major.

2. *Arts breadth courses* emphasize how the traditions, literature, and history of the arts and architecture express the cultural values of society. These courses introduce major figures, ideas, and artistic achievements in coherent patterns across substantial chronological ranges. They examine the terminology, techniques, attitudes, ideas, and skills that the arts areas comprise, so students can understand the approaches to human existence that distinguish the arts.
3. *Humanities breadth courses* emphasize coherent overviews of cultural and intellectual currents shaping or interpreting individual and social values. In thematically coherent patterns, they relate major figures, ideas, achievements, and/or world-shaping events to the most enduring continuities in human experience. Breadth courses in history, literature, philosophy, religion, and interdisciplinary humanities explore these topics across substantial chronological ranges, consistently relating the past to the present.
4. *Social and behavioral science breadth courses* emphasize major concepts, findings, and analytic methods most useful to an informed citizenry that needs to understand politics, economic systems, social institutions, individual and group behavior, and human communication. Such courses emphasize how an understanding of the multiple nature of causality in social settings can bear on the formulation of individual and social values.

B. Depth Courses

Depth courses, while emphasizing the same concepts as the breadth courses, are narrower in scope. Depth courses provide opportunities to pursue selected major concepts, issues, and achievements in more detail than is possible in breadth courses. Depth courses also emphasize how a particular focus, whether on the past or present, is relevant to current individual, social, and/or scientific issues. The varying degrees of specialization in depth courses extend or deepen the perspectives, knowledge, and analytic skills emphasized in breadth courses.

Listed depth courses are generally numbered below the 200 level. A student who has developed general interests and competencies in any of the four distribution areas may, in consultation with an adviser and with the approval of the student's college dean, substitute 200- to 499-level courses for those on the list of depth courses.

AGRICULTURAL BUSINESS

Courses to be Used for General Education

A. Skills (6 credits)

1. WRITING/SPEAKING (3 credits)

Courses designated with the suffix GWS satisfy this component.

2. QUANTIFICATION (3 credits)

Courses designated with the suffix GQ satisfy this component.

B. Distribution Component (12 credits)

Both breadth and depth courses satisfy this component. Students must take at least 3 credits of breadth or depth courses in each of the four areas of the distribution component.

1. *Breadth courses* are identified by the suffix G followed by a letter code corresponding to each of the distribution areas.

a. Natural sciences breadth courses (GN)

b. Arts breadth courses (GA)

c. Humanities breadth courses (GH)

d. Social and behavioral sciences breadth courses (GS)

2. *Depth courses* are identified by the suffix D followed by a letter code corresponding to each of the distribution areas, e.g., depth courses in the natural sciences carry the suffix DN. A student may, in consultation with the adviser and the approval of the student's college dean, substitute 200- to 499-level courses for those on the list of depth courses.

a. Natural sciences depth courses (DN)

b. Arts depth courses (DA)

c. Humanities depth courses (DH)

d. Social and behavioral sciences depth courses (DS)

C. An additional 3 credits in any General Education area

Students whose academic majors are in the areas of natural sciences, arts, humanities, and social and behavioral sciences may not meet the General Education program components by taking courses in the department or program *identical* to that of the academic major. All general education courses are to help students explore and integrate information beyond the specific focuses of their major.

RESERVATIONS—The University reserves the right to make such program or class changes as may become necessary because of insufficient enrollment or other contingencies. The University also reserves the right to make any necessary changes in tuition and charges without prior notice. Courses and programs described and listed in this bulletin are also subject to change without notice.

AGRICULTURAL BUSINESS (2 AGB)

PROFESSOR NEIL B. GINGRICH, *in charge*

The Agricultural Business major prepares students for employment in commercial agriculture and businesses serving agriculture. Three options allow students to specialize in either crop or livestock production or in agricultural business, which provides training in management, business organization, and sales.

The first two semesters are offered at selected Penn State campuses, where students fulfill basic course requirements in accounting, business, English, and natural and social sciences. The second

year at the University Park Campus provides course work in livestock and crop production, management, and agricultural business. As part of the requirements, there are supporting courses in agricultural engineering, farm management, agricultural marketing and sales. Each option allows the student a choice of electives to satisfy special interests and needs.

For the Associate in Science degree in Agricultural Business, a minimum of 68 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(9–12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

ELECTIVES: 0–6 credits

X

X

REQUIREMENTS FOR THE MAJOR: 53–59 credits

(This includes 9–12 credits of General Education courses; 6 credits of GWS courses; 3 credits of DN courses; 0–3 credits of DS courses)

REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 26 credits

PRESCRIBED COURSES (23 credits)

ACCTG 101(3), B LAW 243(3), BIOL 101 DN(4), 102 DN(4),
CHEM 011(3), ENGL 105 GWS(3), SPCOM 100 GWS(3)

X

—

ADDITIONAL COURSES (3)

ENGL 202A GWS OR 202D GWS(3)

X

—

REQUIREMENTS FOR THE OPTION: 27–33 credits

ANIMAL PRODUCTION OPTION: 33 credits

PRESCRIBED COURSES (18 credits)

AG E 214(3), AGRO 028(3), 200(3), AN SC 100(3),
202(3), PTYSC 201(1), 202(2)

—

X

ADDITIONAL COURSES (6 credits)

AG EC 101 DS, 106, or 208(3)
AN SC 007 or 201(3)

—

X

—

X

SUPPORTING COURSES AND RELATED AREAS (9 credits)

Select 6 credits in agricultural economics
Select 3 credits in agricultural engineering

—

X

—

X

CROP PRODUCTION OPTION: 27 credits

PRESCRIBED COURSES (18 credits)

AG E 214(3), 322(3), AGRO 028(3), 200(3),
AG EC 102(3), ENT 012(3)

—

X

ADDITIONAL COURSE (3 credits)

AG EC 101 DS, 106, or 208(3)

—

X

SUPPORTING COURSES AND RELATED AREAS (6 credits)

Select 3 credits in animal science or poultry science
Select 3 credits in horticulture

—

X

—

X

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL OPTION: 33 credits

PRESCRIBED COURSES (6 credits)

| | | |
|---------------------------|---|---|
| AG EC 297(3), AGRO 200(3) | — | X |
|---------------------------|---|---|

ADDITIONAL COURSES (15 credits)

| | | |
|---|---|---|
| AG EC 101 DS or 208(3); AG EC 102 or 232(3) | — | X |
| AG EC 106 or 200(3); AGRO 028 or PLTSC 200(3) | — | X |
| MGMT 100 or MKTG 220(3) | — | X |

SUPPORTING COURSES AND RELATED AREAS (12 credits)

| | | |
|---|---|---|
| Select 3 credits in agriculture or business | — | X |
| Select 3 credits in agricultural engineering | — | X |
| Select 6 credits in animal or poultry science | — | X |

ARCHITECTURAL ENGINEERING TECHNOLOGY (2 AET)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*

PROFESSOR DALE DROST, *Program Chair, Fayette Campus*

The Architectural Engineering Technology major is designed to provide technically trained personnel between the level of high school graduate and professional architectural engineer or architect to support the architectural design and construction industries. Architectural engineering technicians work under the supervision of a graduate architect or architectural engineer. They translate sketches and design concepts into working drawings and specifications. To do so, they need basic skills in structural and environmental systems design and layout, familiarity with site planning, knowledge of building materials and equipment characteristics and performance, as well as the training in drafting techniques required for the realization of final drawings and specifications. The graduates of this major are prepared for employment in architectural, building engineering, or industrialized housing firms.

Graduates of the Architectural Engineering Technology major may qualify for admission to baccalaureate degree majors in Energy Technology, Mechanical Engineering Technology, or Structural Design and Construction Engineering Technology offered at Penn State Harrisburg. Or they may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering degree in Architectural Engineering Technology, a minimum of 72 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63-64 credits

(This includes 12 credits of General Education courses: 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses)

Scheduling Recommendation
by Semester Standing
1-2 3-4

PRESCRIBED COURSES (58 credits)

| | | |
|---|---|---|
| AE T 101(3), 102(3), 103(3), 113(2), CMPSC 101 GQ(3), EG T 101(1), 102(1), ENGL 015 GWS(3), MATH 087 GQ(5), 088 GQ(5), MCH T 111(3), PHYS 150 DN(3) | X | — |
| AE T 204(3), 206(2), 207(3), 210(3), 214(3), 215(3), PHYS 151(3), SPCOM 100 GWS(3) | — | X |

ADDITIONAL COURSES (5-6 credits)

| | | |
|--|---|---|
| Select 5-6 credits from the following technical courses: AE T 212, 297, BES T 101, 297, CE T 261, CHEM 011, CMPSC 102, EE T 100, EG T 103, 104, 201, 297, IE T 105, MATH 140, 141, 231, 250, MCH T 213, ME T 207, 281 | — | X |
|--|---|---|

BIOMEDICAL EQUIPMENT TECHNOLOGY (2 BET)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*

PROFESSOR RICHARD ASTON, *Program Chair, Wilkes-Barre Campus*

During the past several decades, the medical community has grown to depend increasingly on machines for the delivery of quality health care. Biomedical equipment technicians are men and women responsible for maintaining these machines in accurate and safe working order. Their tasks include functional and safety inspecting, preventive maintenance, calibration, troubleshooting, and repair of this equipment. In addition, they may be involved in equipment control programs, in electrical safety assurance programs, and in training hospital personnel in the safe and proper use of the equipment. The classroom and laboratory portions of this major focus on electronically based patient monitoring equipment. The student is, however, exposed to a much broader spectrum of biomedical equipment through a ten-week practical internship in an approved health care facility.

Graduates of the Biomedical Equipment Technology major may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Harrisburg and at Penn State Erie, The Behrend College.

For the Associate in Engineering degree in Biomedical Equipment Technology, 75 credits are required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

Scheduling Recommendation
by Semester Standing
1-2 3-4 Summer

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 66 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (63 credits)

| | | | |
|--|---|---|---|
| CMPSC 101 GQ (3), ENGL 015 GWS (3), MATH 087 GQ (5), 088 GQ (5) | X | — | — |
|--|---|---|---|

| | <i>Scheduling Recommendation by Semester Standing</i> | | |
|---|---|-----|--------|
| | 1-2 | 3-4 | Summer |
| EE T 101(3), 109 (1), 114(3), 117(3), 118(1), 120(1), EG T 101(1), 102(1), ENGR 002(1) | X | — | — |
| BIOL 041(3), CHEM 011(3), PHYS 150 GN(3), SPCOM 100 GWS(3) | — | X | — |
| BE T 201(5), 202(5), 204(3), 205(3) | — | X | — |
| BE T 203 (4) | — | — | X |

ADDITIONAL COURSE (3 credits)

Select 3 credits from the following technical courses:

BE T 297, BIOL 029, CE T 261, CMPSC 102,

EE T 211, 213, 297, EG T 203, IE 315, MCH T 211,

or ME T 207

— X —

BUILDING ENERGY SYSTEMS TECHNOLOGY (2BEST)PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*PROFESSOR DAVID MEREDITH, *Program Chair, Fayette Campus*

The Building Energy Systems Technology major prepares engineering technicians to work in all phases of the heating, ventilating, and air conditioning (HVAC) industry: from design to installation, from technical sales to testing, from customer service to system trouble-shooting. Graduates are employed by public utilities, by building contractors, by systems manufacturers and by design firms. A few have started their own businesses. Some graduates prepare the detailed design drawings for new buildings, sizing components and locating them in their structures. Others select and specify the equipment needed for safe and efficient operation of HVAC systems. Still others test existing systems and recommend improvements in energy management. Technical sales positions in these industries are also available. The program's emphasis on energy systems enables graduates to understand both conventional and state-of-the-art technology, including active and passive solar systems. Graduates are prepared for current and future positions in the industry.

For the Associate in Engineering degree in Building Energy Systems Technology, a minimum of 71 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

| <i>Scheduling Recommendation by Semester Standing</i> | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)**REQUIREMENTS FOR THE MAJOR: 62-63 credits**

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (57 credits)

AE T 101(3), 102(3), BES T 101(2), CMPSC 101 GQ(3),
EG T 101(1), 102(1), ENGL 015 GWS(3), MATH 087 GQ(5),
088 GQ(5), ME T 281(4), PHYS 150 DN(3)

X —

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

AE T 103(3), 204(3), BES T 204(3), 207(3), 208(3), 209(3),
PHYS 151(3), SPCOM 100 GWS(3)

— X

ADDITIONAL COURSES (5–6 credits)

Select 5–6 credits from the following technical courses:

AE T 207, 209, 210, 214, 215, 297, BES T 206, 297,
CMPSC 102, CHEM 011, 012, EG T 201, 297,
MCH T 111, 212, 213, MATH 140, 141, 231, 250

— X

BUSINESS ADMINISTRATION (2 B A)

PROFESSOR BENJAMIN HENSZEY, *in charge*

The two-year, college-level academic Business Administration major is designed to provide instruction in business administration that fulfills the requirements of various levels of responsibility higher than that held by high school graduates.

The primary objective of this major is to provide a managerially oriented program with sufficient communicative and mathematical skills, socially relevant course work, and advanced courses in specific business specialties to develop a well-rounded graduate.

Graduates of the Business Administration major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Business Administration, Humanities, or Public Policy offered at Penn State Harrisburg. Or they may qualify for one of the following baccalaureate degree majors offered at Penn State Erie, The Behrend College: Accounting, Business Economics, General Business, Management, or Management Information Systems.

For the Associate in Science degree in Business Administration, 68 credits are required.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

GENERAL EDUCATION: 21 credits

(6 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63 credits

(This includes 6 credits of GWS General Education courses.)

PRESCRIBED COURSES (30 credits)

ACCTG 101(3), 104(3), B LAW 243(3), ENGL 015 GWS(3),
ENGL 202D GWS(3), FIN 100(3), M I S 100(3), MGMT 100(3),
MKTG 221(3), SPCOM 100 GWS(3)

X X

ADDITIONAL COURSES (21 credits)

Q B A 101 or 801(3)
ECON 002 GS, 004 GS, or 014 GS(3)#
Select 15 credits from ACCTG 803, 806, 810, B A 100, 250, 803,
B LAW 850, B LOG 301, 304, 305, CMPSC 101 GQ, 102,
140, 803, 890, ECON 002 GS,* 004 GS,* FIN 108, 810,

X —
— X

#Students going on to a four-year program should not take ECON 014.

*Select one not taken above.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

H P A 101, 301, 310, INS 102, 810, 820, 830, I B 862,
L I R 100 DS, M I S 101, 103, 106, 110, 111, MGMT 802,
MKTG 220, 801-810, OPMGT 801, PHIL 106,
Q B A 102, R EST 100, 810, or 830

— X

SUPPORTING COURSES AND RELATED AREAS (2 credits)

Select 2 credits in physical education

X X

CHEMICAL ENGINEERING TECHNOLOGY (2CHET)*

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*

The Chemical Engineering Technology major prepares students for positions as assistants to chemists, chemical engineers, and petroleum engineers, assistants in research and control laboratories, and trainees for future supervisory positions in manufacturing and production. Graduates of the major have a reasonable proficiency in basic sciences (chemistry, mathematics, and physics), communication skills, and the basic principles of chemical engineering technology.

Graduates of the Chemical Engineering Technology major may qualify for admission to the baccalaureate degree major in Energy Technology offered at Penn State Harrisburg.

For the Associate in Engineering degree in Chemical Engineering Technology, 69-70 credits are required.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

GENERAL EDUCATION: 21 credits

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 44-45 credits

PRESCRIBED COURSES (39-40 credits)

E G 001(2), PHYS 150(3)

X —

CHEM 012(3-4), 013(3), 014(1), 015(1), 023(4), 034(3),

PHYS 151(3)

X X

CH ET 810(4), 811(5), 821(2), 822(2), 830(3)

— X

ADDITIONAL COURSES (5 credits)

Select 5 credits from the following technical courses:

BI SC 003, BIOL 041, 101, CH ET 831, CHEM 035,

CMPS 102, EG T 201, 297, MCH T 111, I E 315, I E T 105,

MATH 140, 141, 231, 250, METEO 003, OR MICRB 106

— X

*This program is not currently being offered to entering students.

COMPUTER SCIENCE (2CPSC)

PROFESSOR M. DEAN FENTON, *in charge*

The primary objective of the two-year Computer Science major is to prepare graduates for immediate and continuing employability as application programmers, associate systems designers, or associate systems programmers.

To meet this objective the major is designed to ensure a thorough knowledge of the techniques of programming general purpose digital computers, and includes extensive practice—using contemporary programming technologies—in the analysis, organization, validation, and documentation of effective computer code. The major also includes practical knowledge of the logical organization of modern digital computers and related peripheral equipment, the structure of operating systems and compilers, and considerations in the design of information systems.

The General Education component provides the student with an extension to the basic educational foundation. The general Requirements for the Major give the graduate technical competence in the computing and data processing field. The Application Specialization provides a practical knowledge of an area of application within which the graduate may profitably utilize the acquired computing talent.

For the Associate in Science degree in Computer Science, a minimum of 64 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2, 3-4

GENERAL EDUCATION: 21 credits

(9 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See the description of General Education at front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 52 credits

(This includes 9 credits of General Education courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (34 credits)

| | | |
|---|---|---|
| CMPSC 100(3), 101 GQ(3), 102(3), 140(3), ENGL 015 GWS(3), | | |
| SPCOM 100 GWS(3) | X | X |
| CMPSC 142(3), 144(4), 154(3), 164(3), 174(2), 175(1) | — | X |

ADDITIONAL COURSES (6 credits)

| | | |
|--|---|---|
| ENGL 202C GWS OR 202D GWS(3) | X | X |
| Select 3 credits from MATH 005 GQ or above | X | X |

SUPPORTING COURSES AND RELATED AREAS (12 credits)

| | | |
|--|---|---|
| Select 9 credits of related courses in a technical specialization in | | |
| consultation with adviser | X | X |
| Select 3 credits in Q B A, STAT, or MATH (above MATH 005 GQ) | X | X |

DIETETIC FOOD SYSTEMS MANAGEMENT (2EDSM)

PROFESSOR SARA PARKS, *in charge*

The purpose of the Dietetic Food Systems Management major is to prepare food systems management dietetic technicians for middle management positions in the food service area of health care facilities or community feeding operations. Candidates for admission to this major must be employed at least fifteen hours a week in a health care facility food service operation where their

ELECTRICAL ENGINEERING TECHNOLOGY

work is supervised by a registered dietitian. Graduates become eligible for technician membership in the American Dietetic Association.

Students who meet admission criteria are admitted to the extended degree major in Dietetic Food Systems Management. The required courses are available primarily through correspondence study offered by the Department of Independent Learning.

Students who achieve outstanding records may, upon completion of this major, apply for admission to the Management Dietetics option of the baccalaureate degree major in Hotel, Restaurant, and Institutional Management in the College of Health and Human Development.

For the Associate in Science degree in Dietetic Food Systems Management, a minimum of 67 credits is required.

| <i>Scheduling Recommendation by Semester Standing</i> | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits
(3 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

ELECTIVES: 3 credits

REQUIREMENTS FOR THE MAJOR: 46 credits
(This includes 3 credits of GS courses of General Education courses.)

| | | |
|---|---|---|
| PRESCRIBED COURSES (37 credits) | | |
| D S M 100(1), 101(3), 103(3), 195(2), 205(3), 250(4), 260(4) | X | X |
| D S M 270(3), 295(4), 304(3), H P A 101(3), NUTR 252(4) | X | X |
| ADDITIONAL COURSES (6 credits) | | |
| NUTR 151 or 251 GHS(3) | X | X |
| SOC 001 GS or 003 GS(3) | X | X |
| SUPPORTING COURSES AND RELATED AREAS (6 credits) | | |
| Select 6 credits in consultation with the adviser to develop competence as a dietetic practitioner. | X | X |

ELECTRICAL ENGINEERING TECHNOLOGY (2 EET)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*
PROFESSOR EDWARD DREISBACH, *Program Chair, Wilkes-Barre Campus*

The Electrical Engineering Technology major prepares graduates for technological service with manufacturers of electrical, electronic, and computer equipment; electrical utilities; and electrical maintenance and instrumentation departments of various industrial concerns. The principal objective is to provide a practical knowledge of electronic, digital, and microprocessor theory as well as electrical machinery and its applications.

Graduates of the Electrical Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology or in Energy Technology offered at Penn State Harrisburg. Or they may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering degree in Electrical Engineering Technology, a minimum of 72 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See General Education description in front of the *Bulletin*.)**REQUIREMENTS FOR THE MAJOR: 63-64 credits**

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (62 credits)

| | | |
|--|---|---|
| CMPS C 101 GQ(3), EE T 101(3), 109(1), 114(3), 117(3), 118(1), 120(1), EG T 101(1), 102(1), ENGL 015 GWS(3), ENGR 002(1), MATH 087 GQ (5), 088 GQ(5) | X | — |
| EE T 204(2), 205(1), 206(1), 210(3), 211(4), 213(3), 215(3), 216(3), 219(1), 221(1), PHYS 150 DN(3), 151(3), SPCOM 100 GWS(3) | — | X |

ADDITIONAL COURSES (1-2 credits)

Select 1-2 credits from the following technical courses:

| | | |
|--|---|---|
| BI SC 003, CHEM 011, 012, CE T 261, CMPS C 102, EE T 297, EG T 103, 104, I E 315, IE T 105, MATH 140, 141, MCH T 110, or 111 | — | X |
|--|---|---|

FOREST TECHNOLOGY (2 FORT)PROFESSOR KENNETH J. SWISHER, *in charge*

The objectives of the Forest Technology major are to train forestry field personnel in the technical aspects of evaluating, managing, and protecting forest resources. Practicums held on the Michaux State Forest, adjacent to the campus, stress field applications of classroom theory. Both written and oral communication skills are stressed in all courses. Graduates of the program are employed by businesses including federal and state timber management and recreation programs, urban tree service companies, pulp and paper manufacturers, surveying and landscaping firms, power companies and other businesses requiring personnel skilled in field data-gathering analysis and presentation.

Some graduates transfer their credits to bachelor's degree programs such as business management, wildlife science, forest science, geology, parks and recreation, and environmental resource management.

For the Associate in Science degree in Forest Technology, a minimum of 66 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 Summer 3-4

GENERAL EDUCATION: 21 credits(See description of General Education in front of *Bulletin*.)**REQUIREMENTS FOR THE MAJOR: 45 credits****PRESCRIBED COURSES (39 credits)**

| | | | |
|---|---|---|---|
| FOR 105(3), 137(1), 138(1), 140(2), 141(4), 240(3), 245(2), 250(3) | X | — | — |
| FOR 106(2), 108(1), 822(1) | — | X | — |
| FOR 220(3), 221(1), 242(3), 814(1), 860(1) | — | — | X |
| FOR 234(3), 241(4) | — | — | X |

| Scheduling Recommendation by Semester Standing | | |
|---|--------|-----|
| 1-2 | Summer | 3-4 |

ADDITIONAL COURSES (6 credits)
Select 6 credits from ACCTG 101, FOR 817,
WILDL 101, OR 207

| | | |
|---|---|---|
| — | — | X |
|---|---|---|

HIGHWAY ENGINEERING TECHNOLOGY
(2 HET)*

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*

The Highway Engineering Technology major prepares highway construction technicians to perform many of the planning and design tasks necessary in the construction of highways, railroads, bridges, and airports. In the planning stages of construction, a highway construction technician may be engaged in estimating costs, purchasing materials, preparing specifications, computing fills, cuts, and drainage requirements, drafting, designing, or surveying. During actual construction such technicians may perform supervisory functions and inspection.

Graduates of the Highway Engineering Technology major may qualify for admission to the baccalaureate degree major in Structural Design and Construction Engineering Technology offered at Penn State Harrisburg.

For the Associate in Engineering degree in Highway Engineering Technology, 70 credits are required.

| Scheduling Recommendation by Semester Standing | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits
(See description of General Education in front of *Bulletin*)

REQUIREMENTS FOR THE MAJOR: 45 credits

| PRESCRIBED COURSES (45 credits) | | |
|---|---|---|
| CE T 109(2), 111(3), 112(3), 118(2), E G 001(2), ENGL 826(3), PHYS 150(3) | X | — |
| CE T 214(3), 821(3), 822(3), 823(3), 824(3), 825(3), MCH T 111(3), 113(3), PHYS 151(3) | — | X |

HOTEL, RESTAURANT, AND INSTITUTIONAL
MANAGEMENT (2HRIM)

JAMES A. BARDI, *Director*

The Hotel, Restaurant, and Institutional Management major is an intensive four-semester major designed to prepare students for managerial positions in the hospitality industry. The course of study places heavy reliance on experience acquired in an on-the-job setting.

*This program is not currently being offered to entering students.

Students who achieve outstanding records may, upon completing this program, apply for admission to the baccalaureate degree major in Hotel, Restaurant, and Institutional Management in the College of Health and Human Development. Six or more additional semesters of satisfactory work are required to earn the baccalaureate degree. Graduates of this major may qualify for admission to other baccalaureate degree majors.

For the Associate in Science degree in Hotel, Restaurant, and Institutional Management, a minimum of 66 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 45 credits

PRESCRIBED COURSES (34 credits)

| | | |
|--|---|---|
| ACCTG 101(3), HR&IM 201(2), 204(3), 250(4), 260(4), 270(4) | X | X |
| HR&IM 295(2), 310(3), 320(3), 337(3), 380(3) | X | X |

SUPPORTING COURSES AND RELATED AREAS (11 credits)

| | | |
|--|---|---|
| Select 3 credits in nutrition | X | X |
| Select 8 credits in consultation with adviser to develop a competency in management or general business administration | X | X |

INDIVIDUAL AND FAMILY STUDIES AND SERVICES (2EIFS)

PROFESSOR JOHN NESSELROADE, *Acting Head*

This major integrates practical and academic experiences to provide the student with entry-level professional competence in one of several human service fields. The objective of the major is to offer a general education background, a knowledge base in life-span and family development, and a core of professional skills that may be applied in program planning and service delivery activities.

For the Associate in Science degree in Individual and Family Studies and Services, a minimum of 62 credits is required.

ADULT DEVELOPMENT AND AGING OPTION: This option is designed to prepare students for a wide variety of service roles in nursing homes, area agencies on aging, senior citizen centers, and other sites for services to the elderly.

CHILD AND YOUTH SERVICES OPTION: This option is designed to prepare students for a variety of service roles in day and residential child and youth care systems, preschools, Head Start centers, and other child and youth service settings.

FAMILY SERVICES OPTION: This option is designed to prepare students for employment, under a variety of job titles, in the delivery of family services. Such services are offered across a wide range of settings: day care, Head Start, parent education, family planning, drug and alcohol programs, agencies for the disabled, child, youth, and family health and welfare agencies.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)**ELECTIVES: 2-4 credits****REQUIREMENTS FOR THE MAJOR: 49-51 credits**

(This includes 12 credits of General Education courses; 6 credits of GWS courses; 3 credits of GS courses; 3 credits of DH courses.)

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 32-33 credits**PRESCRIBED COURSES (26-27 credits)**

ENGL 015 GWS(3), I F S 129 DS(3), PSY 002 GS(3),

SPCOM 100 GWS(3)

X —

I F S 216 DS(3)

X X

H DEV 395(8-9), I F S 315(3)

— X

ADDITIONAL COURSES (6 credits)

PHIL 103 DH or 104 DH(3)

X —

EDPSY 014 or I F S 200(3)

X —

REQUIREMENTS FOR THE OPTION: 17-18 credits**ADULT DEVELOPMENT AND AGING OPTION: 17-18 credits****PRESCRIBED COURSES (6 credits)**

I F S 249 DS(3), 311(3)

X X

ADDITIONAL COURSES (2-3 credits)

Select 2-3 credits from H P A 101(3), HL ED 060 GHS(3),

I F S 218(3), 219(3), 297(1-3), NUTR 251 GHS(3),

PSY 174(3), RC PK 120(3), 256(3), 277(3)

X X

SUPPORTING COURSES AND RELATED AREAS (9 credits)

Select 9 credits in consultation with the adviser from

University-wide offerings that enhance

competence in the option.

— X

CHILD AND YOUTH SERVICES OPTION: 17-18 credits**ADDITIONAL COURSES (8-9 credits)**

I F S 229 DS or 239 DS(3)

X X

Select 5-6 credits from I F S 297(1-2), 330(1-4),

HL ED 303 GHS(2), A ED 003 or 014(3),

NUTR 251 GHS(3), PSY 213(3)

X X

SUPPORTING COURSES AND RELATED AREAS (9 credits)

Select 9 credits in consultation with the adviser from

University-wide offerings that enhance

competence in the option.

— X

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

FAMILY SERVICES OPTION: 17–18 credits**PRESCRIBED COURSES (6 credits)**

| | | |
|----------------------|---|---|
| I F S 219(3), 311(3) | X | X |
|----------------------|---|---|

ADDITIONAL COURSES (2–3 credits)

| | | |
|--|---|---|
| Select 2–3 credits from I F S 218(3), 229 DS, 297(1–3) | X | X |
|--|---|---|

SUPPORTING COURSES AND RELATED AREAS (9 credits)

| | | |
|---|---|---|
| Select 9 credits in consultation with the adviser from University-wide offerings that enhance competence in the option. | — | X |
|---|---|---|

LABOR STUDIES (2 LBR)PROFESSOR RONALD L. FILIPPELLI, *in charge*

The purpose of the Labor Studies program is to help employees improve their understanding and competence in coping with personal, group, and organizational problems at their worksites, in relationships with employers, and in transactions with the community, the economy, and the polity. The program consists of a core of labor courses supplemented by introductory liberal arts studies that provide (1) basic communication skills, (2) conceptual tools of analysis, and (3) a more general cultural context for the examination of labor problems.

For the Associate in Arts degree in Labor Studies, a minimum of 60 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 39 credits**PRESCRIBED COURSES (18 credits)**

| | | |
|---|---|---|
| L I R 100 DS(3), 102(3), 103(3), 104(3), 156(3), 296(3) | X | X |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (21 credits)

| | | |
|---|---|---|
| Select 21 credits from the following areas in consultation with adviser: economics, history, industrial engineering, journalism, labor and industrial relations, management, political science, psychology, sociology. | X | X |
|---|---|---|

LETTERS, ARTS, AND SCIENCES (2 LAS)PROFESSOR JEANETTE D. BRAGGER, *in charge*

The objectives of the Letters, Arts, and Sciences major are to broaden the student's understanding, interests, and skills; to help the student become a more responsible, productive member of the family and community; and to offer a degree program with sufficient electives to permit some special-

LETTERS, ARTS, AND SCIENCES

ization according to the student's interests or career plans. Letters, Arts, and Sciences is a complete two-year degree major. However, graduates who later seek admission to baccalaureate degree majors may apply baccalaureate credits toward the new degree. Any 800-level credits taken in the Letters, Arts, and Sciences program are not applicable toward most baccalaureate degrees.

In addition to a wide variety of baccalaureate majors offered at University Park, graduates of the Letters, Arts, and Sciences major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Elementary Education, Humanities, or Public Policy offered at Penn State Harrisburg. Or they may qualify for any of a large number of baccalaureate degree majors offered by Penn State Erie, The Behrend College, in business, the liberal arts, and sciences.

For the Associate in Arts degree in Letters, Arts, and Sciences, a minimum of 60 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits#

(6 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

ELECTIVES: 15 credits

REQUIREMENTS FOR THE MAJOR: 30 credits#

(This includes 6 credits of General Education GWS courses.)

PRESCRIBED COURSES (6 credits)

| | | |
|------------------|---|---|
| ENGL 015 GWS(3) | X | — |
| SPCOM 100 GWS(3) | — | X |

ADDITIONAL COURSE (3 credits)

| | | |
|------------------------------|---|---|
| ENGL 202A, B, C, or D GWS(3) | — | X |
|------------------------------|---|---|

SUPPORTING COURSES AND RELATED AREAS (21 credits)#

| | | |
|---|---|---|
| Select 3 credits in any courses designated as arts* | X | X |
| Select 3 credits in any courses designated as humanities* | X | X |
| Select 3 credits in any courses designated as social and behavioral sciences* | X | X |
| Select 3 credits in any courses designated as physical, biological, or earth sciences* | X | X |
| Select 9 credits in any one of the following areas*: arts, humanities, social and behavioral sciences, natural sciences and quantification, and foreign language skills. (If foreign language courses are chosen, it is recommended that these courses be in one foreign language sequence.) | X | X |

#The 45 required credits of General Education and Requirements for the Major must be baccalaureate-level courses. For students intending to seek admission to a baccalaureate program upon graduation, it is recommended that most, if not all, of the courses be at the baccalaureate level. For those students who will seek a Bachelor of Arts degree upon graduation from Letters, Arts, and Sciences, it is strongly recommended that a foreign language be taken since admission to a Bachelor of Arts program in the College of the Liberal Arts requires one college-level course, or the equivalent, in a foreign language.

*Courses that will satisfy the arts, humanities, social and behavioral sciences, natural sciences, and quantification requirements are defined on the Letters, Arts, and Sciences checksheet, which may be obtained from the College of the Liberal Arts associate dean for undergraduate studies at the University Park Campus or from any Letters, Arts, and Sciences representative at the Commonwealth Campuses.

MATERIALS ENGINEERING TECHNOLOGY (2MATE)

PROFESSOR W. MURRAY SMALL, *in charge*

The 1980s have seen several remarkable changes occurring within the materials industry. First, there has been the shifting profile among products of commerce, away from metals and toward ceramics and polymers. Second, there has been the increasing emphasis on the quality of products with the implementation of on-line instrumental checks for defects and statistical analysis. Third, there is a broad awareness about the importance of materials and manufacturing to a strong U.S. economy. Highly trained materials technicians have significant roles to play in this industry. Their training qualifies them to perform and supervise mechanical property and quality assurance tests on a variety of products. This program is designed to supply the student with extensive laboratory background to these key elements of materials technology. Courses are offered to give the student an exposure to the breadth of materials technology both from the basic side and frequent contact with industry.

For the Associate in Engineering degree in Materials Engineering Technology, a minimum of 64 credits is required.

*Scheduling Recommendation
by Semester Standing*

| | | |
|-----|-----|--------|
| 1-2 | 3-4 | Summer |
|-----|-----|--------|

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 55 credits

(This includes 12 credits of General Education courses: 6 credits of GWS courses; 3 credits of DN courses; 3 credits of GQ courses.)

PRESCRIBED COURSES (52 credits)

| | | | |
|---|---|---|---|
| CHEM 012 DN(3), 014 DN(1), CMPSC 101 GQ (3), EG T 101(1), 102(1), ENGL 015 GWS(3), MATH 087 GQ(5), 088 GQ(5), PHYS 150(3), 151(3) | X | — | — |
| ENGL 202C GWS(3), IE T 109(3), MAT T 200(3), 201(3), 202(3), 203(3), 204(3), SPCOM 100 GWS(3) | — | X | — |

ADDITIONAL COURSES (3 credits)

| | | | |
|--------------------------|---|---|---|
| IE T 112 or MAT T 295(3) | — | — | X |
|--------------------------|---|---|---|

MECHANICAL ENGINEERING TECHNOLOGY (2 MET)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*

PROFESSOR MERWIN WEED, *Program Chair, McKeesport Campus*

The Mechanical Engineering Technology major is intended to prepare detail or layout drafters and junior designers for manufacturing industries as well as for the many concerns engaged in installation or erection work. The principal objective is to prepare men and women for employment in machine design, tool and die design, or structural layout. Some graduates are involved in technical or industrial sales, become supervisors in light and heavy industry, or enter management trainee programs.

Graduates of this major may qualify for admission to the baccalaureate degree majors in Mechanical Engineering Technology, Structural Design and Construction Engineering Technology, or Energy Technology offered at Penn State Harrisburg. Or they may qualify for admission to the Mechanical Design and Materials option of the baccalaureate degree majors in either Mechanical or Plastics Engineering Technology offered at Penn State Erie, The Behrend College.

MEDICAL LABORATORY TECHNOLOGY

For the Associate in Engineering degree in Mechanical Engineering Technology, a minimum of 72 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

| Scheduling Recommendation by Semester Standing | | | |
|---|--------|-----|--|
| 1-2 | Summer | 3-4 | |

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63-64 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (61 credits)

| | | | |
|---|---|---|---|
| CMPS 101 GQ(3), ENGL 015 GWS(3), EG T 101(1), 102(1), 103(2), 104(1), IE T 101(3), 102(1), MATH 087 GQ(5), 088 GQ(5), MCH T 111(3), PHYS 150 DN(3) | X | — | — |
| IE T 112(3) | — | X | — |
| EE T 100(3), EG T 201(2), ENGL 202C GWS(3), IE T 215(3), MCH T 213(3), 214(1), ME T 206(3), 210(3), PHYS 151(3), SPCOM 100 GWS(3) | — | — | X |

ADDITIONAL COURSES (2-3 credits)

Select 2-3 credits from the following technical courses:

| | | | |
|---|---|---|---|
| AE T 209, 297, CE T 111, 261, 297, EG T 297, IE T 105, 109, 297, ME T 207, 281, or 297 | — | — | X |
|---|---|---|---|

MEDICAL LABORATORY TECHNOLOGY (2 MLT)

PROFESSOR PHILIP MOHR, *in charge*

The two-calendar-year Medical Laboratory Technology major (four semesters, two summer sessions) is designed to provide the necessary general and technical training for hospital personnel between the levels of the medical laboratory technician (certificate program) and the medical technologist (baccalaureate program). The course of study includes one year of intensive clinical experience at an affiliated hospital and the theoretical background necessary for the clinical procedures performed by the certified medical laboratory technician (associate degree program). Upon completion of major requirements, the student receives the associate degree and is eligible to sit for examinations leading to certification and registry as a medical laboratory technician.

Graduates of the Medical Laboratory Technology majors may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Humanities, or Public Policy offered at Penn State Harrisburg.

For the Associate in Science degree in Medical Laboratory Technology, a minimum of 69-71 credits is required.

GENERAL EDUCATION: 21 credits

(11-13 of the 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

| <i>Scheduling Recommendation by Semester Standing</i> | | |
|---|-----|-----|
| Summer | 1-2 | 3-4 |

REQUIREMENTS FOR THE MAJOR: 60-63 credits

(This includes 11-13 credits of General Education courses: 6 credits of GWS courses; 3 credits of GN courses; 2-4 credits of GQ courses.)

PRESCRIBED COURSES (58-59 credits)

| | | | |
|---|---|---|---|
| ENGL 015 GWS(3), MICRB 150(4), SPCOM 100 GWS(3) | X | — | — |
| BIOL 041(3), 042(1), 101 DN(4), CHEM 012 DN(3-4), 014 DN(1), 034(3), CMPSC 001(1), MICRB 201(3), 202(2) | — | X | — |
| MICRB 151A(7), 151B(6), 151C(6), 151D(6), 151E(2) | — | — | X |

ADDITIONAL COURSES (2-4 credits)

| | | | |
|--|---|---|---|
| Select 2-4 credits from MATH 005 GQ(3), 006 GQ(3), 007 GQ(3), 017 GQ(3), 018 GQ(3), 110 GQ(4), 111 GQ(2), 140 GQ(4), STAT 200 GQ(4), or 250 GQ (3) | X | — | — |
|--|---|---|---|

MICROCOMPUTER ENGINEERING TECHNOLOGY (2MCMP)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*

PROFESSOR ARTHUR MARSICANO, *Program Chair, Schuylkill Campus*

The Microcomputer Engineering Technology major is designed to prepare graduates for technical positions in the rapidly expanding field of microcomputers and their applications. A broad background in electrical and electronic principles is used as a foundation upon which to build the basic concepts of the microprocessor, to examine its internal functions, and to investigate its applications. Exposure to a variety of microprocessor/microcomputer systems and devices used with computers as well as hands-on experience in the operation, analysis, and construction of small computer systems provides graduates with a sound foundation for installing, diagnosing, and servicing microprocessor/microcomputer systems and the devices used with them.

Graduates of the Microcomputer Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology or in Energy Technology offered at Penn State Harrisburg. Or they may qualify for the baccalaureate Electrical Engineering Technology major offered at Penn State Erie, The Behrend College.

For the Associate in Engineering degree in Microcomputer Engineering Technology, a minimum of 73 credits is required.

| <i>Scheduling Recommendation by Semester Standing</i> | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 64-66 credits

(This includes 12 credits of General Education courses: 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (60 credits)

| | | |
|---|---|---|
| EE T 101(3), 109(1), 114(3), 117(3), 118(1), 120(1), EG T 101(1), 102(1), ENGL 015 GWS(3), ENGR 002(1), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN(3) | X | — |
|---|---|---|

*Scheduling Recommendation
by Semester Standing*

1-2

3-4

CMPSC 101 GQ(3), EE T 205(1), 210(3), 211(4),
MCMP 240(5), 241(4), 242(3), PHYS 151(3),
SPCOM 100 GWS (3)

—

X

ADDITIONAL COURSES (4-6 credits)

Select 1-3 credits from the following technical courses:

BI SC 003, CHEM 011, 012, CE T 261, CMPSC 102,
EE T 297, MCH T 213, MCMP 297, or ME T 207

—

X

SUPPORTING COURSES AND RELATED AREAS (3 credits)

Select 3 credits in computer science

—

X

MINING TECHNOLOGY (2MNGT)

PROFESSOR STANLEY C. SUBOLESKI, *in charge*

A student in the Mining Technology major covers a blend of basic sciences, mathematics, communications, arts, humanities, social sciences, and applied courses during the period of study. These courses are sequenced so that basic principles of physical processes are used to understand the specific procedures involved in mining. The curriculum covers a breadth of material at a level consistent with potential careers of mining technology graduates.

This major prepares students for either a management-oriented or an engineering-oriented position in the mining industry. Many graduates of this major, after serving the required apprenticeship, become certified managers in their fields.

Graduates of the Mining Technology major may qualify for admission to the baccalaureate degree majors in Energy Technology or in Structural Design and Construction Engineering Technology offered at Penn State Harrisburg.

For the Associate in Engineering degree in Mining Technology, 72 to 73 credits are required.

MAINTENANCE OPTION: This option prepares students to become maintenance supervisors. Initially, graduates may work as apprentice electricians or mechanics to gain experience in repairs and planned maintenance. After certification is obtained, they may become involved with maintenance planning, working as or with the chief mine mechanic or chief mine electrician.

PRODUCTION OPTION: This option prepares students to become mine foremen or engineering aides. Initially, some of the duties are to run transit and act as survey party chief, keep mine maps up to date and make projections, take samples and run analyses, make time studies, and assist with materials-handling layouts.

SURFACE MINING OPTION: This option prepares students for work as engineering aides or as supervisors in surface mining. At first, graduates work as assistants to engineers or to other supervisors. After a period of training, graduates may become involved in such areas of mining as pit design, equipment utilization, environmental control, reclamation, and mine laws and regulations.

GENERAL EDUCATION: 21 credits

(15 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

REQUIREMENTS FOR THE MAJOR: 67 credits
(This includes 15 credits of General Education courses.)

REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 43 credits

PRESCRIBED COURSES (43 credits)

| | | |
|--|---|---|
| CHEM 011(3), ECON 014 GS(3), GEOSC 020 GN(3), SPCOM 100 GWS(3) | X | — |
| CMPSC 101 GQ(3), E G 001(2), ENGL 015 GWS(3), MATH 087 GQ(5), 088 GQ(5), MCH T 111(3), MNG T 800(1), 804(3), 806(3), PHYS GN(3)* | X | X |

REQUIREMENTS FOR THE OPTION: 24 credits

MAINTENANCE OPTION: 24 credits

PRESCRIBED COURSES (24 credits)

| | | |
|--|---|---|
| MNG T 801(3), 802(3), 807(3), 808(3), 809(3), 810(3), 811(3), MGMT 100(3) | — | X |
|--|---|---|

PRODUCTION OPTION: 23 credits

PRESCRIBED COURSES (20 credits)

| | | |
|---|---|---|
| MN PR 061(3), MNG 023(3), 030(2), MNG T 801(3), 802(3), 803(3), 805(3) | — | X |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (3 credits)

| | | |
|---------------------------------------|---|---|
| Select 3 credits in mining technology | — | X |
|---------------------------------------|---|---|

SURFACE MINING OPTION: 24 credits

PRESCRIBED COURSES (21 credits)

| | | |
|---|---|---|
| MN PR 061(3), MNG 023(3), MNG T 815(3), 816(3), 817(3), 818(3), 819(3) | — | X |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (3 credits)

| | | |
|---------------------------------------|---|---|
| Select 3 credits in mining technology | — | X |
|---------------------------------------|---|---|

NUCLEAR ENGINEERING TECHNOLOGY (2 NET)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*

PROFESSOR MASOUD FEIZ, *Program Chair, Beaver Campus*

The Nuclear Engineering Technology major is designed to provide technically trained personnel to support the rapidly developing nuclear industry. The wide scope of training prepares the nuclear technician for careers in radiation safety, reactor operations, radioisotope handling, nuclear and control instrumentation, fuel fabrication, and health physics. A nuclear technician may work as a radiological safety specialist, engineering aide, or enter training as a reactor operator at a nuclear facility.

Graduates of the Nuclear Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology offered at Penn State Harrisburg. Or they may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Erie, The Behrend College.

*See department for appropriate course.

PHYSICAL THERAPIST ASSISTANCE

For the Associate in Engineering degree in Nuclear Engineering Technology, a minimum of 70 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

| Scheduling Recommendation by Semester Standing | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits
(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 61 credits
(This includes 12 credits of General Education courses: 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

| PRESCRIBED COURSES (61 credits) | | |
|---|---|---|
| CHEM 011(3), CMPSC 101 GQ(3), EE T 101(3), 109(1), EG T 101(1), 102(1), ENGL 015 GWS(3), 202C GWS(3), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN (3), SPCOM 100 GWS(3) | X | — |
| NE T 201(3), 202(4), 203(3), 204(3), 205(2), 212(3), 214(3), 215(3), PHYS 151(3) | — | X |

PHYSICAL THERAPIST ASSISTANCE (2 PTA)

PROFESSOR RICHARD ST. PIERRE, *in charge*

The Physical Therapist Assistance program prepares individuals to become skilled technical health workers who assist the physical therapist in patient treatment. Students develop knowledge and skills in the appropriate use of equipment and exercise associated with various physical therapy treatment modalities. In order to accomplish these tasks, the major utilizes a combination of basic science and nonscience course work coupled with health education courses specifically designed for the physical therapist assistant. The program culminates with a full semester of clinical experience.

To enter this major, students must have a high school diploma and satisfactory Scholastic Aptitude Test scores.

The size of each entering class is limited so that optimal clinical experiences and practical application situations can be maintained. Students are admitted into the program only during the fall semester and must progress through the program in the prescribed manner. Clinical affiliations are maintained over a wide geographical area. Students may be required to make special housing and transportation arrangements during the clinical phase.

For the Associate in Science degree in Physical Therapist Assistance, a minimum of 71 credits is required.

GENERAL EDUCATION: 21 credits
(6 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

ELECTIVES: 6 credits

| <i>Scheduling Recommendation by Semester Standing</i> | | | |
|---|-----|---|--|
| 1-2 | 3-4 | 5 | |

REQUIREMENTS FOR THE MAJOR: 50 credits

(This includes 6 credits of General Education courses; 3 credits of GWS courses; 3 credits of GN courses.)

PRESCRIBED COURSES (50 credits)

| | | | |
|--|---|---|---|
| BIOL 029(4), 041(3), 042(3), HL ED 384(3), 800(3), 802(1), 803(3), 807(1), 808(1) | X | — | — |
| PHYS 001 GN(3) | X | X | — |
| ENGL 202C GWS(3), HL ED 303(3), 801(4), 804(3), 805(2) | — | X | — |
| HL ED 806(12)* | — | — | X |

RAILWAY ENGINEERING TECHNOLOGY (2 RET)*

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*

The objective of the Railway Engineering Technology major is to prepare railway technicians for the revitalized railway industry. Such individuals will be able to run surveys, solve right-of-way and drainage problems, deal with track layout and maintenance problems, and work with basic railway structures. Graduates of the Railway Engineering Technology major may find employment as track foremen, track supervisors, track inspectors, or management trainees with the American railroads; as track inspectors with the Federal Railroad Administration; or as designers and estimators with consulting engineers.

Graduates of the Railway Engineering Technology major may qualify for admission to the baccalaureate degree major in Structural Design and Construction Engineering Technology offered at Penn State Harrisburg.

For the Associate in Engineering degree in Railway Engineering Technology, 69–70 credits are required.

GENERAL EDUCATION: 21 credits

(See description of General Education in front of *Bulletin*.)

*Courses that include clinical education experiences may require the student to travel long distances or obtain housing near the assigned clinic. Housing and transportation arrangements are the responsibility of the student.

*This program is not currently being offered to entering students.

| Scheduling Recommendation by Semester Standing | | | |
|---|--------|-----|--|
| 1-2 | Summer | 3-4 | |

REQUIREMENTS FOR THE MAJOR: 44-45 credits

| | | | |
|---|---|---|---|
| PRESCRIBED COURSES (42 credits) | | | |
| CE T 109(2), 111(3), 112(3), 118(2), E G 001(2), PHYS 150(3), 151(3) | X | — | X |
| CE T 113(4) | — | X | — |
| CE T 840(3), 841(3), 842(3), 843(3), EE T 100(2), MCH T 111(3), 113(3) | — | — | X |
| ADDITIONAL COURSES (2-3 credits) | | | |
| Select 2-3 credits from the following technical courses: | | | |
| CE T 822, 823, 824, 825, 297, 261, CHEM 011, 012, CMPSC 102, EE T 100, EG T 201, 297, I E 315, 805, MATH 140, 141, 231, ME T 100, OR 207. | — | — | X |

SCIENCE (2SC)

PROFESSOR GARY MULLEN, *in charge*

The Science major is primarily designed to provide for the basic educational needs of students who want to pursue professional programs in various medically related fields. The program provides a fundamental group of science courses of value to those who seek positions in government or industry where such knowledge is necessary or desirable.

The Radiologic Technologist Radiographer option requires seven semesters (five semesters and two summer sessions) of formal classroom and clinical education. In the clinical practicum, the student is required to demonstrate competency in performing examinations under supervision in the radiology department of a participating hospital. This generally requires between 1800 and 2400 clock hours. In addition to receiving the Associate in Science degree, the student who successfully completes the major is eligible to take the American Registry of Radiologic Technologists (ARRT) examination for certification.

Graduates of the General option of the Science major may qualify for admission to the baccalaureate degree major in Mathematical Sciences offered at Penn State Harrisburg.

For the Associate in Science degree in Science, 66-71 credits are required.

| Scheduling Recommendation by Semester Standing | | | |
|---|-----|-----|---|
| 1-2 | 3-4 | 5-6 | 7 |

GENERAL EDUCATION: 21 credits

(12-15 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 57-65 credits

(This includes 12-15 credits of General Education courses: 3 credits of DH courses; 3 credits of DN courses; 6 credits of GQ courses.)

REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 26 credits

| | | | |
|--|---|---|---|
| PRESCRIBED COURSES (26 credits) | | | |
| BIOL 029(4), 101 DN(4), PHYS 150 DN(3), CHEM 011(3) | X | — | — |

*Scheduling Recommendation
by Semester Standing*

| 1-2 | 3-4 | 5-6 | 7 |
|-----|-----|-----|---|
|-----|-----|-----|---|

| | | | | |
|-----------------------------------|---|---|---|---|
| ENGL 015 GWS(3), SPCOM 100 GWS(3) | X | X | — | — |
| BIOL 041(3), PHYS 151(3) | — | X | — | — |

REQUIREMENTS FOR THE OPTION: 31-39 credits**GENERAL OPTION: 31 credits****PRESCRIBED COURSES (10 credits)**

| | | | | |
|---|---|---|---|---|
| MATH 110 GQ(4) | X | — | — | — |
| CMPSC 101 GQ(3), MICRB 106 GN(2), 107 GN(1) | — | X | — | — |

ADDITIONAL COURSES (15 credits)

| | | | | |
|-----------------------------|---|---|---|---|
| MATH 005 GQ or 006 GQ(3) | X | — | — | — |
| CHEM 034 or BIOCH 001 GN(3) | — | X | — | — |

Select 12 credits from the following biological, mathematical,
and physical science courses:

| | | | | |
|---|---|---|---|---|
| ASTRO 001 GN(3), BIOL 033 DN(3), 042(1), 102 DN(4), BI SC 003 GN(3), CHEM 035(3), 102(3), MATH 111 GQ(2), PHIL 212 GQ(3), PHYS 297(3) or STAT 200 GQ(4) | X | X | — | — |
|---|---|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (3 credits)

| | | | | |
|---|---|---|---|---|
| Select 3 credits from arts and humanities | X | X | — | — |
|---|---|---|---|---|

RADIOLOGIC TECHNOLOGIST RADIOGRAPHER OPTION: 39 credits**PRESCRIBED COURSES (39 credits)**

| | | | | |
|---|---|---|---|---|
| BIOL 033 DN(3), CMPSC 100(3), HUMAN 101 DH(3), MATH 005 GQ(3), 006 GQ(3), PHYS 297(3), R T R 101(3), 102(3) | X | — | — | — |
| R T R 103(3), 104(3) | — | X | — | — |
| R T R 105(3), 106(3) | — | — | X | — |
| R T R 107(3) | — | — | — | X |

SOCIOLOGY (2ESOC)**PROFESSOR JOSEPH FAULKNER, *in charge***

This major introduces students to the study of human groups and their relationships to each other and to the environment. It enables students to gain some proficiency in the scientific study of group structures and processes. A further objective is to help students become more skillful in working with community institutions, agencies, and organizations either through gainful employment or as a volunteer.

Graduates may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Humanities, or Public Policy offered at Penn State Harrisburg.

For the Associate in Arts degree in Sociology, a minimum of 60 credits is required.

GENERAL EDUCATION: 21 credits

(See description of General Education in front of *Bulletin*.)

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

ELECTIVES: 9 credits**REQUIREMENTS FOR THE MAJOR: 30 credits****PRESCRIBED COURSES (6 credits)**

| | | |
|---------------|---|---|
| SOC 001 GS(3) | X | — |
| SOC 007(3) | — | X |

ADDITIONAL COURSES (12 credits)

| | | |
|---|---|---|
| Select 12 credits from SOC 003 GS, 005 GS, 012 DS, 013 DS, 015 DS, 023 DS, 030 DS, 047, 055 DS | X | X |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (12 credits)

| | | |
|--|---|---|
| Select 12 credits in arts, humanities, social and behavioral sciences | X | X |
|--|---|---|

SURVEYING TECHNOLOGY (2 SRT)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*

PROFESSOR JOHN KOLESAR, *Program Chair, Wilkes-Barre Campus*

The objectives of the major are to provide a knowledge of the elements of surveying as applied to construction, land, topographic, geodetic, city, and photogrammetric surveys, and to develop trained personnel who understand the relation between the precision of measurements and the interpretation of data in addition to having an appreciation of the skills and equipment needed to make precise measurements in the field of surveying.

Graduates of the Surveying Technology major may qualify for admission to the baccalaureate degree major in Structural Design and Construction Engineering Technology offered at Penn State Harrisburg.

For the Associate in Engineering degree in Surveying Technology, a minimum of 72 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

*Scheduling Recommendation
by Semester Standing*
1-2 Summer 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63-64 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (61 credits)

| | | | |
|--|---|---|---|
| CE T 109(2), 111(3), 112(3), 118(2), EG T 101(1), 102(1), ENGL 015 GWS(3), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN(3), 151(3) | X | — | — |
|--|---|---|---|

Scheduling Recommendation
by Semester Standing

1-2 Summer 3-4

| | | | |
|---|---|---|---|
| CE T 210(2), 214(3), 215(3), 216(3), 290(3), CMPSC 101 GQ(3), EG T 103(2), 104(1), ENGL 202C GWS(3), SPCOM 100 GWS(3) | — | X | — |
| CE T 113(4) | — | — | X |

ADDITIONAL COURSES (2-3 credits)

Select 2-3 credits from the following technical courses:

| | | | |
|---|---|---|---|
| CE T 217, 261, 297, CHEM 011, 012, CMPSC 102, EE T 100, EG T 201, 297, I E 315, IE T 105, MATH 140, 141, 231, or ME T 111 | — | — | X |
|---|---|---|---|

TELECOMMUNICATIONS TECHNOLOGY (2TELT)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*PROFESSOR HAROLD GROFF, *Program Chair, Wilkes-Barre Campus*

The field of telecommunications includes the transmission of voice and digital signals by telephone, telegraph, radio, and satellite. Graduates of the Telecommunications Technology major will be engineering technicians who help select, design, install, operate, maintain, trouble-shoot, and repair modern telecommunications systems. Future uses for telecommunications systems include electronic mail, electronic shopping, home computer terminal tie-ins, remote utility meter reading, and the transmission of biomedical data between hospitals, libraries, and doctors' offices.

Graduates of the Telecommunications Technology major may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Harrisburg, or Penn State Erie, The Behrend College.

For the Associate in Engineering degree in Telecommunications Technology, a minimum of 72 credits is required.

Scheduling Recommendation
by Semester Standing

1-2 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63-65 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (62 credits)

| | | |
|---|---|---|
| CMPSC 101 GQ(3); E T 101(3), 109(1), 114(3), 118(1), 205(1), 210(3), EG T 101(1), 102(1), ENGL 015 GWS(3), ENGR 002(1), MATH 087 GQ(5), 088 GQ(5), TELCM 140(2) | X | — |
| EE T 117(3), 120(1), 211(4), 216(3), 221(1), PHYS 150 DN(3), 151(3), SPCOM 100 GWS(3), TELCM 241(3), 242(1), 243(3), 244(1) | — | X |

Scheduling Recommendation
by Semester Standing
1-2 3-4

ADDITIONAL COURSES (1-3)

Select 1-3 courses from the following technical courses:
BE T 297, CE T 261, CMPSC 102, EE T 211, 213, 297,
EG T 203, IE 315, MCH T 111, ME T 207

— X

WILDLIFE TECHNOLOGY (2WLT)

PROFESSOR MICHAEL J. LACKI, *in charge*

The Wildlife Technology major prepares students in the techniques of wildlife management. Personnel trained in this field are needed to assist in the applied phases of natural resource management, wildlife biology, range management, and the care, maintenance, and propagation of animals. Graduates should be able to support professionals in wildlife biology, park managers, game refuge managers, and laboratory technicians in research.

For the Associate in Science degree in Wildlife Technology, a minimum of 65 credits is required.

Scheduling Recommendation
by Semester Standing
1-2 3-4

GENERAL EDUCATION: 21 credits
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 44 credits

PRESCRIBED COURSES (44 credits)

CE T 109(2), FOR 240(3), 250(3), WILDL 101(3),
103(3), 802(2), 806(2)
AG 113(1), FOR 242(3), HL ED 013 GHS(1),
WILDL 204(4), 207(3), 208(3), 209(4),
211(4), 213(3)

X —

— X

COURSE DESCRIPTIONS

CREDITS AND HOURS

Credits are awarded on the semester-hour basis. According to Senate Policy 42-23, a total of at least forty hours of work planned and arranged by the University faculty is required for the average student to gain 1 credit. While the distribution of time varies from course to course, generally, one-third of the time is devoted to formal instruction, such as lecture, recitation, laboratory, field trips, etc., and two-thirds of the time to outside preparation.

Credits, classroom work, and practicum or laboratory work are indicated by three numbers in parentheses immediately following the course title—for example (3:3:0):

1. The first number shows the maximum credits authorized for the course.
2. The second number shows the periods of classroom work (including lecture, recitation, class discussion, demonstration, or various combinations of these).
3. The third number shows the periods of practicum work (including laboratory, shop work, studio, drafting room, field trips, etc.).

A typical class period is fifty minutes.

Courses numbered from 800 to 899 are reserved for the associate degree majors. Credit received for 800-series courses may be applicable to a particular baccalaureate degree program offered by the University at the discretion of the appropriate college and major department. Courses numbered from 1 to 399 carry baccalaureate credit and are required in most of the associate degree majors. Elective credit courses vary from campus to campus and semester to semester, and all of the courses listed here are not offered at each campus. Students can obtain information about the specific course offerings for a given campus from the appropriate *Schedule of Classes*. Descriptions of prerequisite courses listed here by number only may be found in the *Baccalaureate Degree Programs Bulletin*.

GENERAL EDUCATION SUFFIXES

The following suffixes are used in the course description section to designate courses that have been approved for General Education:

Skills Courses

Writing/Speaking—GWS
Quantification—GQ
Health Sciences—GHS
Physical Education—GPE

Breadth Courses

Natural Sciences—GN
Arts—GA
Humanities—GH
Social and Behavioral Sciences—GS

Depth Courses

Natural Sciences—DN
Arts—DA
Humanities—DH
Social and Behavioral Sciences—DS

NOTE: Many of the courses listed under subject headings here are General Education courses only. For a complete list of courses under each subject heading and a complete list of foreign language courses, including Arabic, Chinese, Hebrew, and Japanese, see the *Baccalaureate Degree Programs Bulletin*.

ACCOUNTING (ACCTG)

016. INTRODUCTORY ACCOUNTING SURVEY (3:3:0) Accounting for proprietorships, partnerships, and corporations for retailers and manufacturers; financial statement analysis. Students who have passed ACCTG 101 may not schedule this course.

101. INTRODUCTORY FINANCIAL ACCOUNTING (3:2-1/2:1) Fundamentals of the collection, recording, summarization, and interpretation of accounting data.

AGRICULTURAL ECONOMICS

104. INTRODUCTORY MANAGERIAL ACCOUNTING (3:2-1/2:1) Actual and standard cost systems; managerial uses of cost data. Prerequisite: ACCTG 101.
801. INTRODUCTORY ACCOUNTING (3:2:1)
802. INTRODUCTORY ACCOUNTING (3:2:1) Prerequisite: ACCTG 801.
803. INTERMEDIATE ACCOUNTING (3:3:0) Financial accounting statements, concepts, and procedures; assets, liabilities, owners' equity, statement analysis. Prerequisite: ACCTG 802.
806. FEDERAL TAX ACCOUNTING (3:3:0) Federal tax revenue system as it affects the individual and business; tax planning, research, and preparation of returns. Prerequisite: ACCTG 802.
807. MANAGERIAL ACCOUNTING (3:3:0) Cost and budgetary control; preparation of information for decision making. Prerequisite: ACCTG 802.
810. INTRODUCTION TO FEDERAL TAX PREPARATION (1:1:0) Preparation of tax returns for low-income and elderly individuals in cooperation with the IRS Volunteer Income Tax Assistance Program. Prerequisite: ACCTG 101 or 802.
816. INTRODUCTORY ACCOUNTING SURVEY (3:3:0) Fundamentals of accumulation and summarization of accounting data; emphasis on financial statement analysis and the uses of accounting in business.

AGRICULTURAL ECONOMICS (AG EC)

101. (DS) INTRODUCTION TO AGRICULTURAL ECONOMICS (3:3:0) Application of economic principles to resource allocation problems in the production, marketing, and consumption of food and agricultural products. Not open to students in the Agricultural Economics and Rural Sociology or Agricultural Business Management major or students who have completed ECON 302.
102. INTRODUCTION TO FOOD AND AGRICULTURAL MARKETING (3:3:0) Comprehensive theoretical and descriptive survey of farm and food products marketing from the perspective of producers, marketing middlemen, and consumers.
106. INTRODUCTION TO FARM MANAGEMENT (3:3:0) Organizing and operating farm businesses for financial success; measuring profits; improving efficiency of labor, land, capital; getting started in farming.

AMERICAN STUDIES (AM ST)

100. (GH) INTRODUCTION TO AMERICAN STUDIES (3:3:0) A study of selected attempts to identify and interpret movements and patterns in American culture. Prerequisite: third-semester standing.
105. (DH) AMERICAN POPULAR CULTURE AND FOLKLIFE (3:3:0) Survey of popular culture, folk life, and ethnicity, synthesizing material from such areas as literature, media, entertainment, print, music, and film.
196. (ENGL 196) INTRODUCTION TO AMERICAN FOLKLORE (3:3:0) A basic introduction to verbal and nonverbal folklore stressing the basic procedures of collection, classification, and analysis.
197. (ENGL 197) AMERICAN FOLK SONG IN ENGLISH (3:3:0) British songs in America; native repertoires, white and black; folk ballad; and musical development.

ANTHROPOLOGY (ANTH)

001. (GS) INTRODUCTORY ANTHROPOLOGY (3:3:0) Prehistoric and traditional peoples and cultures; traditional customs and institutions compared with those of modern society.
- 002 (GS) INTRODUCTION TO ARCHAEOLOGY (3:3:0) This course surveys basic approaches used by archaeologists to interpret prehistoric human cultural patterns.
008. (DS) AZTECS, MAYAS, AND INCAS (3:3:0) Comparative survey of the development of the pre-Columbian Latin American civilizations.
009. (DS) RISE OF CIVILIZATION IN THE OLD WORLD (3:3:0) Evolution of Old World complex societies, especially the first great civilizations of Mesopotamia, Egypt, China, and the Indus Valley.
011. (DS) INTRODUCTORY NORTH AMERICAN ARCHAEOLOGY (3:3:0) Introduction to archaeology of the North American Indians; site methods, and results of research interpreted in cultural history.
021. (GN) INTRODUCTORY BIOLOGICAL ANTHROPOLOGY (3:3:0) The role of human biology and evolution in culture, society, and behavior.

045. (GS) CULTURAL ANTHROPOLOGY (3:3:0) Beginnings of human culture; economic life, society, government, religion, and art among traditional peoples.
146. (DS) NORTH AMERICAN INDIANS (3:3:0) An introduction to the cultures of the indigenous peoples of North America, north of Mexico, and the effect of contact.

ARCHITECTURAL ENGINEERING TECHNOLOGY (AE T)

101. BUILDING MATERIALS (3:3:0) Structural and architectural use of building materials and construction assemblies.
102. METHODS OF CONSTRUCTION (3:1:5) Materials and methods of construction used in buildings, as expressed in drawings. Prerequisite or concurrent: AE T 101, EG T 001, and 002.
103. PLUMBING AND FIRE PROTECTION (3:2:2) Layout of plumbing and fire protection in buildings to meet code and usage requirements. Prerequisite or concurrent: AE T 102.
204. HEATING, VENTILATING, AND AIR CONDITIONING LAYOUT (3:2:2) Fundamental calculations and layout of systems in buildings. Prerequisite: AE T 103. Or concurrent: AE T 102.
206. ARCHITECTURAL PRESENTATION (2:1:2) Visual communication through architectural presentation drawings. Line, value, color, and composition. Prerequisite: EG 001 and 003.
207. ADVANCED CONSTRUCTION METHODS (3:1:5) Integration of materials and systems in working drawings. Prerequisite: fourth-semester standing.
209. STRUCTURE DESIGN (3:2:3) Elementary principles of structural design and detailing in timber, steel, and reinforced concrete; use of handbooks; fundamentals of structural and architectural drafting. Prerequisites: MCH T 213; AE T 102 or EG T 201.
210. ARCHITECTURAL ENGINEERING OFFICE PRACTICE (3:3:0) Procedures involved in production of contract documents, both drawings and specifications. Prerequisite: fourth-semester standing.
212. BUILDING LIGHTING AND ELECTRICAL LAYOUT (3:2:2) Layout of lighting and electrical distribution in buildings.
213. SITE PLANNING (2:1:2) Energy conservation through optimum site utilization, contours, cut and fill calculations, storm drainage, spot grading, and finish grading.
214. STEEL CONSTRUCTION (3:2:2) Strength of materials as applied to the design of simple steel structures. Prerequisites: AE T 102, MCH T 111.
215. CONCRETE CONSTRUCTION (3:2:2) Fundamentals of design and construction of reinforced concrete structures. Prerequisites: AE T 102, MCH T 111.
297. SELECTED TOPICS IN ARCHITECTURAL ENGINEERING TECHNOLOGY (3) Individual or group work in architectural engineering technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.

ART (ART)

001. (GA) THE VISUAL ARTS AND THE STUDIO: AN INTRODUCTION (3:3:0) Introduction to the visual arts; the practice of the visual arts; social, cultural, and aesthetic implications of studio activity.
100. (GA) CONCEPTS AND CREATION IN THE VISUAL ARTS (3:1:4) A study of the personal and cultural foundations of artistic creation and practice of creative production in the art studio.
110. (DA) DESIGN: TWO DIMENSIONAL (3:2:4) Introduction to design in two dimensions. Pictorial space and the principles of visual organization of the flat surface.
111. (DA) DESIGN: THREE DIMENSIONAL (3:2:4) Introduction to design in three dimensions. Principles of visual organization in working with actual space and volume.
120. (DA) INTRODUCTION TO DRAWING (3:2:4) The study and practice of basic drawing as a way of understanding and communicating.
121. DRAWING: TECHNIQUES, MATERIALS, AND TOOLS (3:2:4) Drawing with an emphasis on organization and the development of drawing skills through a variety of techniques, materials, and tools. Prerequisite: ART 120.
130. (DA) INTRODUCTION TO SCULPTURE I (3:2:4) An introduction to sculpture consisting of lectures, demonstrations, and basic studio work coordinated to cover a broad range of processes.
180. (DA) CERAMIC ARTS (3:2:4) Introduction to potter's wheel techniques; experiments with decorative application; includes the technical concerns for clay, glazes, and kilns. For non-Art majors.
215. (DA) INTRODUCTORY FIBER ARTS (3:1:5) Theory development and introduction to fiber arts, with emphasis on the loom and nonloom textile art processes.
217. (DA) INTRODUCTION TO METAL ARTS (3:2:4) Introduction to fundamental jewelry-making and small-scale metalsmithing processes, including conceptualization, fabrication, surface treatment, and finishing of metalwork.

ART EDUCATION

- 240. (DA) INTRODUCTION TO PRINTMAKING: INTAGLIO (3:2:4) Instruction and practice in the fundamentals of the intaglio process; its relationship to the design and meaning of the print.
- 241. (DA) INTRODUCTION TO PRINTMAKING: LITHOGRAPHY (3:2:4) Instruction and practice in the fundamentals of the lithographic process; its relationship to the design and meaning of the print.
- 250. (DA) BEGINNING OIL PAINTING (3:2:4) The materials and techniques of painting in oil and their uses in creative painting on panels and canvas.
- 251. (DA) ACRYLIC PAINTING (3:2:4) Introduction to the materials and techniques of creative painting with acrylic paints.
- 260. (DA) BEGINNING WATERCOLOR PAINTING (3:2:4) Transparent watercolor painting on various papers; knowledge of materials, development of skills and creativity.
- 270. (DA) INTRODUCTION TO GRAPHIC DESIGN (3:2:4) Orientation to graphic design and the methods of the designer; experimentation in language and visual symbolism in communication of ideas.
- 280. INTRODUCTORY CERAMIC ARTS (3:2:4) The fundamentals of ceramics, throwing, hand-building, and glazing; acquainting the student with ceramic materials, techniques, and philosophy. Prerequisite: 2 credits in studio art.
- 290. (DA) PHOTOGRAPHY I (3:2:4) Fundamental black-white techniques. Introduction to inherent qualities of photographic vision through study of historic/contemporary photography. Camera, light meter required.
- 296. INDEPENDENT STUDIES (1-18)

ART EDUCATION (A ED)

- 014. INTRODUCTORY CRAFTS FOR TEACHERS (3:1:5) Direct experience with materials such as wood, clay, metal, paper, textiles, and plastics in relationship to the creative needs of children.

ART HISTORY (ART H)

- 100. (GA) INTRODUCTION TO ART (3:3:0) An approach to the understanding of art through a critical analysis of selected works of architecture, painting, and sculpture. Students who have passed ART H 110 may not schedule this course.
- 110. SURVEY OF WESTERN ART (3:3:0) General survey of major developments in architecture, painting, and sculpture in the Western world. Students who have passed ART H 100 may not schedule this course.
- 111. (GA) SURVEY OF WESTERN ART I (3:3:0) Survey of the major monuments and trends in the history of art from prehistory through the late Gothic period. Students who have passed ART H 110 may not schedule this course.
- 112. (GA) SURVEY OF WESTERN ART II (3:3:0) Survey of the major monuments and trends in the history of art from the Renaissance to the modern era. Students who have passed ART H 110 may not schedule this course.
- 120. (GA) SURVEY OF EASTERN ART (3:3:0) A general survey of the great periods of art in India, Central Asia, China, Japan, and the Islamic world.
- 211. (DA) ANCIENT ARCHITECTURE (3:3:0) Architecture of Egypt, the Ancient Near East, Greece, and Rome.
- 212. (DA) MEDIEVAL ARCHITECTURE (3:3:0) Architecture of the Christian church from its origin until the Renaissance, with special attention to medieval construction and design.
- 213. (DA) RENAISSANCE-BAROQUE ARCHITECTURE (3:3:0) Survey of architecture from the fifteenth through the eighteenth century in Western Europe.
- 214. (DA) MODERN ARCHITECTURE (3:3:0) Architecture and related arts of sculpture and painting from the end of the eighteenth century to the present day. Nontechnical in nature.
- 301. (DA) EGYPTIAN AND MESOPOTAMIAN ART (3:3:0) Art of the Ancient Near East, including Egypt, Mesopotamia, and neighboring civilizations.
- 303. (DA) ITALIAN RENAISSANCE ART (3:3:0) The major arts in Italy from the thirteenth century A.D. through the Renaissance; emphasis on sculpture and painting.
- 304. (DA) SOUTHERN BAROQUE PAINTING (3:3:0) Seventeenth-century painting in Italy, France, and Spain. Emphasis will be on Italy as the vanguard country.
- 305. (DA) EUROPEAN ART FROM 1780-1860 (3:3:0) A survey of painting and sculpture in Europe from the beginnings of Neoclassicism through the Realist movement. Prerequisite: ART H 100 or 110 or 112.
- 306. (DA) ENGLISH ART (3:3:0) Survey of English art, emphasizing the Middle Ages and the eighteenth and early nineteenth centuries.
- 307. (DA) AMERICAN ART (3:3:0) History of art in the English colonies and the United States from the seventeenth century to the present.

311. (DA) GREEK AND ROMAN ART (3:3:0) Greek and Roman art, with emphasis on painting and sculpture.
312. (DA) ROMANESQUE AND GOTHIC ART (3:3:0) Survey of the architecture, sculpture, and painting of the Christian church in western Europe from 1000 to 1500.
313. (DA) NORTHERN RENAISSANCE ART (3:3:0) Art in northern Europe in the fifteenth and sixteenth centuries, emphasizing painters such as Van Eyck, Dürer, and Bruegel.
314. (DA) ART IN THE AGE OF REMBRANDT (3:3:0) Dutch and Flemish painting in the seventeenth century.
320. (DA) CHINESE ART (3:3:0) A general survey of the great periods of Chinese art from the Shang dynasty until the modern period.
324. (DA) ROCOCO ART (3:3:0) Eighteenth-century art in western Europe, with emphasis on artists such as Watteau, Fragonard, Falconet, Le Gros, Tiepolo, Guardi, Neumann.
325. (DA) MODERN AND CONTEMPORARY ART: SURVEY FROM IMPRESSIONISM TO THE PRESENT (3:3:0) A survey of painting and sculpture from Monet through the present. Prerequisite: ART H 100 or 110 or 112 or 305.
330. (DA) ISLAMIC ART (3:3:0) Survey of the art and architecture of Islamic lands from the late seventh century until the eighteenth century.
342. (DA) RUSSIAN ART AND ARCHITECTURE (3:3:0) Survey of Russian art and architecture from the foundation of the Russian state through the Soviet era.

THE ARTS (ARTS)

001. (GA) THE ARTS (3:3:0) Developing perception in the arts through relating the visual, musical, performing, and environmental arts.
005. (GA) PERFORMING ARTS (3:2:3) Introduction to music, dance, and theatre. Orientation to the aesthetics, theory, and practice of professional performance.
296. INDEPENDENT STUDIES (1-18)

ASTRONOMY (ASTRO)

001. (GN) ASTRONOMICAL UNIVERSE (3:3:0) Nonmathematical description of the astronomical universe and the development of scientific thought. For nonscience majors. Students who have passed ASTRO 090 may not schedule this course.
- * 010. (GN) ELEMENTARY ASTRONOMY (2:2:0) Nonmathematical description of stars, planets, galaxies, and the universe. For nonscience majors. Students who have passed ASTRO 001 or 090 may not schedule this course.
- * 011. (GN) ELEMENTARY ASTRONOMY LABORATORY (1:0:2) Selected experiments and data analysis to illustrate major astronomical principles and techniques. Telescopic observations of stars and galaxies. For nonscience majors. Prerequisite or concurrent: ASTRO 001 or 010.
090. (GN) DESCRIPTIVE ASTRONOMY (3:2:2) Nonmathematical presentation of methods and results of astronomical exploration of the solar system, stars, and galaxies. For nonscience majors. Students who have passed ASTRO 001 may not schedule this course.
291. (GN) ASTRONOMY OF THE SOLAR SYSTEM (3:3:0) Methods and instruments of the astronomer and results obtained by applying them to our solar system. Prerequisite or concurrent: MATH 140.
292. (GN) ASTRONOMY OF STELLAR SYSTEMS (3:3:0) Methods of study and knowledge of the universe beyond the limits of the solar system. Prerequisites or concurrent: MATH 140.

BIOCHEMISTRY (BIOCH)

001. (GN) BIOCHEMICAL SCIENCE (3:3:0) Biochemistry of important functions of man and animals, including genetics, nutrition, metabolic and disease processes, and environmental relationships.

*Students must take a combination of ASTRO 010 and 011 in order to obtain General Education credits in astronomy.

BIOLOGICAL SCIENCE (BI SC)

001. (GN) STRUCTURE AND FUNCTION OF ORGANISMS (3:3:0) Origin, development, and cellular basis of life; fundamental principles, processes, and structures of organisms. Students who have passed BIOL 027, 041, 101, or 102 may not schedule this course.
002. (GN) GENETICS, ECOLOGY, AND EVOLUTION (3:3:0) How living organisms pass on their inheritance, how plants and animals came to be what they are, and how they now react. Students who have passed BIOL 033, 101, 102, or 222 may not schedule this course.
003. (GN) ENVIRONMENTAL SCIENCE (3:3:0) Kinds of environments; past and present uses and abuses of natural resources; disposal of human wastes; prospects for the future. Students who have passed BIOL 210 or any other upper-level ecology course in biology may not schedule this course.
004. (GN) HUMAN BODY: FORM AND FUNCTION (3:3:0) A general survey of structure and function—from conception, through growth and reproduction, to death. Students who have passed BIOL 029 and 041 may not schedule this course.

BIOLOGY (BIOL)

027. INTRODUCTION TO PLANT BIOLOGY (3:2:2) Cellular structure and organization; physiological processes; classification; reproduction and development; relationship of plant groups. Students who have passed BIOL 102 may not schedule this course.
029. MAMMALIAN ANATOMY (4:2:4) Anatomy of a mammal, with special reference to that of man. Students who have passed BIOL 421 may not schedule this course.
033. (DN) HUMAN GENETICS (3:3:0) Human heredity and its individual and social implications. Students who have passed BIOL 222 may not schedule this course.
041. PHYSIOLOGY (3:3:0) Normal functions of the animal body, with special reference to those of man. Students who have passed BIOL 472 may not schedule this course.
042. PHYSIOLOGY LABORATORY (1:0:2) Experiments demonstrating basic physiological principles, with special reference to man. Prerequisite or concurrent: BIOL 041.
101. (DN) PRINCIPLES OF BIOLOGY I (4:3:2) Introduction to cell biology; biology of vertebrates; overview of monerans, protists, and animals.
102. (DN) PRINCIPLES OF BIOLOGY II (4:3:2) Continuation of BIOL 101, with emphasis on plants and fungi; genetics of organisms and populations; evolution. Prerequisite: BIOL 101.

BIOMEDICAL EQUIPMENT TECHNOLOGY (B E T)

201. PHYSIOLOGICAL TRANSDUCERS (5:4:2) Study of the principles of operation and applications of devices used for the conversion of physiological events to electrical signals. Prerequisite: EE T 210.
202. BIOMEDICAL INSTRUMENTATION AND SYSTEMS (5:4:2) Introduction to the operating principles, maintenance, and analytic troubleshooting of electronic fluid and pneumatic biomedical equipment. Prerequisite: B E T 201.
203. BIOMEDICAL EQUIPMENT LABORATORY (Internship) (4:1:6) Practical experience, within or related to the hospital environment, on a variety of biomedical instruments. Prerequisites: B E T 204, BIOL 041.
204. MEDICAL AND CLINICAL EQUIPMENT (3:2:2) Principles of operation of clinical, medical radiography, intensive care, anesthesia, respiratory, non-invasive imaging, and emergency equipment; hospital electrical safety. Prerequisite: B E T 201.
205. HIGH-POWER MEDICAL EQUIPMENT (3:2:1) A study of high-power medical instrumentation using lumped-element p-n junction devices, crystals, and lasers. Equipment for electrosurgery and ultrasonics is included. Prerequisite: EE T 114.
297. SELECTED TOPICS IN BIOMEDICAL EQUIPMENT TECHNOLOGY (3) Individual or group work in biomedical equipment technology for students with specific occupational objectives. Prerequisite: third-semester standing.

BLACK STUDIES (BL ST)

100. (DS) EVOLVING STATUS OF BLACKS IN THE TWENTIETH CENTURY: INTERDISCIPLINARY PERSPECTIVES (3:3:0) An interdisciplinary team-taught exploration of the evolving status of Black Americans in the twentieth century. Emphasis on the civil rights movement.

145. (DH) [RL ST 145(DH)] AFRO-AMERICAN RELIGION (3:3:0) Afro-American religion from the slavery era to the civil rights movement and contemporary churches and sects.
146. (DH) [RL ST 146(DH)] THE LIFE AND THOUGHT OF MARTIN LUTHER KING, JR. (3:3:0) A survey of the civil rights leader, including his religious beliefs, intellectual development, and philosophy for social change.

BUILDING ENERGY SYSTEMS TECHNOLOGY (BES T)

101. INTRODUCTION TO BUILDING ENERGY SYSTEMS (2:1:2) Introduction to building energy systems technology from the standpoint of history, economics, and energy.
204. ANALYSIS OF BUILDING ENERGY SYSTEMS (3:1:5) Comprehensive analysis and application of building energy systems; calculation and layout; computer modeling of systems. Prerequisite: fourth-semester standing.
206. PASSIVE SYSTEMS AND CONSERVATION METHODS (3:3:0) Passive concepts and design; earth sheltering; energy audits and conservation techniques; wood burning equipment.
207. LIQUID HEATING AND COOLING SYSTEMS (3:2:2) Water, steam, and refrigerant systems and components; pumps and piping; heat exchangers; fluid and components selection; power and controls. Prerequisites: BES T 101, ME T 281.
208. AIR HEATING, COOLING, AND VENTILATING SYSTEMS (3:2:2) Air systems and distribution components; fans and ductwork; heat exchange coils; dampers and controls; residential fired equipment operation. Concurrent: BES T 207.
209. NONTECHNICAL ASPECTS OF BUILDING ENERGY SYSTEMS TECHNOLOGY (3:2:2) Economic analysis techniques; cost estimating; job scheduling; legal aspects; warranties; professionalism. Prerequisite: BES T 101.
297. SPECIAL TOPICS (1-9) Individual or group work in building energy systems technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.

BUSINESS ADMINISTRATION (B A)

100. INTRODUCTION TO BUSINESS (3:3:0) A comprehensive view of the contemporary environment of business.
250. PROBLEMS OF SMALL BUSINESS (3:3:0) Analysis of problems of the small firm, particularly for the student who wishes to venture into business. Prerequisite: 3 credits in economics.
803. COOPERATIVE PRACTICUM WITH BUSINESS OFFICES (3-6) Cooperative practical work with business offices under the supervision of the instructor.

BUSINESS LAW (B LAW)

243. LEGAL ENVIRONMENT OF BUSINESS (3:3:0) Social control through law: courts, basic policies underlying individual and contractual rights in everyday society. Prerequisite: third-semester standing.
850. REAL ESTATE LAW (3:3:0) Basic legal principles involved in the negotiations of real estate transactions.

BUSINESS LOGISTICS (B LOG)

301. BUSINESS LOGISTICS MANAGEMENT (3:3:0) Management of logistics function in firm, including physical supply and distribution activities such as transportation, storage facility location, and materials handling. Prerequisite: third-semester standing.
304. TRANSPORT SYSTEMS (3:3:0) Conceptual model of a transport system; environmental relationships; modal components and managerial conditions, with special application to the United States.
305. TRAFFIC MANAGEMENT (3:3:0) Analysis of traffic function in the logistics system. Evaluation of routes, rates, and shipping document procedures. Prerequisite: B LOG 301 or 304.

CHEMICAL ENGINEERING TECHNOLOGY (CH ET)

810. CHEMICAL TECHNOLOGY (4:4:0) Industrial stoichiometry, material balances, heats of reaction. Prerequisite or concurrent: CHEM 013, 015.
811. CHEMICAL TECHNOLOGY (5:5:0) Fluid flow, heat transfer, evaporation, distillation, air-water interaction. Prerequisites: CH ET 810.
821. CHEMICAL TECHNOLOGY LABORATORY (2:1:2) Measurements in stoichiometry, material balances, and heats of reaction; industrial laboratory report writing. Prerequisite or concurrent: CH ET 810.
822. CHEMICAL TECHNOLOGY LABORATORY (2:1:2) Measurements in fluid flow, heat transfer, distillation, mass transfer; chemical analytical techniques. Prerequisite or concurrent: CH ET 811.
830. INDUSTRIAL CHEMISTRY (3:3:0) The commercial preparation of important chemicals and derivatives with emphasis upon the chemistry involved and the flow of material. Prerequisite or concurrent: CHEM 013, 015.
831. SELECTED TOPICS IN CHEMICAL ENGINEERING TECHNOLOGY (3) Individual or group work in chemical engineering technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.

CHEMISTRY (CHEM)

011. INTRODUCTORY CHEMISTRY (3:2:2) Selected principles and applications of chemistry. Prior study of chemistry not assumed.
012. (DN) CHEMICAL PRINCIPLES (3-4) Basic concepts and quantitative relations. Prerequisite: Satisfactory performance on placement examination—students take CHEM 012 for 3 credits. Unsatisfactory performance on placement examination—students take CHEM 012 for 4 credits.
013. (DN) CHEMICAL PRINCIPLES (3:3:0) Continuation of CHEM 012, including introduction to the chemistry of the elements. Prerequisite: CHEM 012 or 017. Prerequisite or concurrent: CHEM 014.
014. (DN) EXPERIMENTAL CHEMISTRY (1:0:3) Introduction to quantitative experimentation in chemistry. Prerequisite or concurrent: CHEM 012.
015. (DN) EXPERIMENTAL CHEMISTRY (1:0:3) Continuation of CHEM 014, with emphasis on analytical procedures. Prerequisite: CHEM 014. Prerequisite or concurrent: CHEM 013.
017. (DN) INTRODUCTORY AND GENERAL CHEMISTRY (5:5:2) Introductory and general chemistry for students who are required to take additional chemistry, e.g., CHEM 013, but are unprepared for CHEM 012. Students may not receive credit for both CHEM 017 and CHEM 011 or 012.
023. INTRODUCTION TO MODERN ANALYTICAL CHEMISTRY (4:2:4) Contemporary methods of chemical and instrumental analysis; including potentiometric titration, specific ion electrodes, spectrophotometry, and chromatography. Prerequisite: CHEM 015.
034. ORGANIC CHEMISTRY (3:3:0) Introduction to organic chemistry, with emphasis on the properties of organic compounds of biochemical importance. Not open to those who have previously scheduled CHEM 037. Prerequisite: CHEM 011 or 012 or 017.
035. ORGANIC CHEMISTRY (3:2:4) Introduction to organic chemistry, with emphasis on the identification of organic compounds by characteristic chemical reactions and by spectroscopy. Prerequisite: CHEM 034.
036. LABORATORY IN ORGANIC CHEMISTRY (4:4:0) Basic laboratory operations; applications of theories and principles. Prerequisite: CHEM 038. Prerequisite or concurrent: CHEM 039 or 040.
037. ORGANIC CHEMISTRY (3:3:0) Introduction to organic chemistry, with emphasis on topics of particular relevance to mineral science, materials science, and engineering. Not open to those who have previously scheduled CHEM 034. Prerequisite: CHEM 011 or 012.
038. ORGANIC CHEMISTRY (4:4:0) Principles and theories; nomenclature; chemistry of the functional groups; applications of spectroscopy. Students may not receive credit for both CHEM 038 and 034. Prerequisite: CHEM 013.
039. ORGANIC CHEMISTRY (3:3:0) Continuation of CHEM 038 to include especially polyfunctional organic molecules and the organic chemistry of biologically important molecules. Students may not receive credit for both CHEM 039 and 040. Prerequisite: CHEM 038.
040. ORGANIC CHEMISTRY (2:2:0) Continuation of CHEM 038 to include especially polyfunctional organic molecules. Student may not receive credit for both CHEM 039 and 040. Prerequisite: CHEM 038.
102. ENVIRONMENTAL CHEMISTRY (3:3:0) Applications of chemistry to environmental problems, including air, water, thermal pollution; pesticides; drugs and birth control agents; food additives; etc. For non-Chemistry majors; Chemistry majors will not receive credit.
389. SPECIAL PROBLEMS AND RESEARCH (1-4) Designed for freshman or sophomore students who are prepared to undertake special problems and research by arrangement with a faculty member.
395. CHEMISTRY TEACHER ASSISTANT TRAINING (1-2) Instruction and practice in the role of the teaching assistant in the undergraduate chemistry laboratory.

CIVIL ENGINEERING TECHNOLOGY (CE T)

109. **TOPOGRAPHIC DRAWING (2:0:4)** Conventional mapping symbols; constructing topographic maps from stadia notes; estimating grading quantities from topographic maps. Prerequisite: EG T 001, 102, or E G 010. Prerequisite or concurrent: CE T 111 or WILD 802.
111. **PLANE SURVEYING (3:2:3)** Theory of plane surveying; use, care, and adjustments of surveying equipment; traversing, areas, leveling, stadia, and plane table mapping. Prerequisite: MATH 087.
112. **CURVES AND EARTHWORK (3:2:3)** Computation and laying out of horizontal and vertical curves; calculation of cut and fill; setting slope stakes for construction. Prerequisite or concurrent: CE T 111, MATH 087.
113. **PRACTICAL FIELD PROBLEMS (4:1:9)** Geodetics, topography, field astronomy; route location; hydrographic surveys; land subdivision; use of electronic measuring devices. Prerequisites: CE T 112, 118.
118. **ROUTE SURVEYING (2:0:4)** Field and office operations connected with highway and railroad location; mass diagram as related to economical distribution of earthwork. Prerequisite: CE T 111. Concurrent: CE T 112.
210. **STATISTICS AND LEAST SQUARES (3:3:0)** Frequency distribution; histograms; frequency polygons; measures of central tendency; dispersion; uses of normal curve; least squares applied to surveying problems. Prerequisite: MATH 088.
214. **PHOTOGRAMMETRY (3:1:4)** Interpretation and use of aerial photographs; mapping by photogrammetric methods; application of aerial and terrestrial photographic surveying to specific engineering problems. Prerequisite: CE T 118.
215. **GEODETIC SURVEYING (3:1:4)** Precision vertical and horizontal control surveys; level nets; reciprocal leveling; triangulation; state plane coordinates; astronomic observations for azimuth and latitude. Prerequisites: CE T 111, MATH 087.
216. **SPECIAL SURVEYS (3:1:4)** Applications of surveying in hydrography, mining, construction, and subdivision planning; surveying registration law and professional ethics. Prerequisites: CE T 112, 113.
217. **CARTOGRAPHIC TECHNIQUES (2:0:4)** Use of tools and equipment; projections used in art, advertising, navigation, government maps; relief methods; scribing techniques; map reproduction methods. Prerequisite: CE T 109.
261. **FLUID FLOW (3:3:0)** Elementary theory of fluid flow: hydrostatics; flow-through orifices, Venturi meters, and pipes; flow in open channels; theory of the centrifugal pump. Prerequisites: MCH T 111, MATH 087.
290. **LEGAL ASPECTS OF SURVEYING (3:3:0)** Legal principles affecting the determination of property boundaries; responsibilities of surveyors, attorneys, title companies, and the court. Prerequisite: CE T 111.
297. **SELECTED TOPICS IN CIVIL ENGINEERING TECHNOLOGY (3)** Individual or group work in civil engineering technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.

COMMUNICATIONS (COMM)

100. (GS) **THE MASS MEDIA AND SOCIETY (3:3:0)** Mass communications in the United States; organization, role, content, and effects of newspapers, magazines, television, radio, books, and films. May not be used to fulfill requirements of any major in the School of Communications.
150. (GA) **THE ART OF THE CINEMA (3:1:3)** The development of cinema to its present state; principles of evaluation and appreciation; examples from the past and present.
205. **WOMEN, MINORITIES, AND THE MEDIA (3:3:0)** Analysis of historical, economic, legal, political, and social implications of the relationship between women, minorities, and the mass media.
260. **NEWS WRITING AND REPORTING (3:2:2)** News and news values; legal and ethical problems of reporting; writing and reporting news for the mass media. Prerequisites: typing proficiency; ENGL 015 or 030; third-semester standing.

COMPARATIVE LITERATURE (C LIT)

001. (GH) **MASTERPIECES OF WESTERN LITERATURE THROUGH THE RENAISSANCE (3:3:0)** Universal themes and cultural values in works by such writers as Homer, Sophocles, Chaucer, Dante, Boccaccio, Rabelais, and Cervantes.
002. (GH) **MASTERPIECES OF WESTERN LITERATURE SINCE THE RENAISSANCE (3:3:0)** Universal themes and cultural values in works by such writers as Voltaire, Goethe, Ibsen, Flaubert, Dostoevsky, Unamuno, Mann, and Borges.
003. (DH) **MASTERPIECES OF LITERATURE FROM AFRICA (3:3:0)** From traditional oral forms to contemporary experimental blends of African and Western literary styles. Readings in English.
004. (DH) **MASTERPIECES OF LITERATURE FROM THE ORIENT (3:3:0)** Major writings from China, Japan, and other East Asian countries, studied in translation and viewed as world literature.

COMPUTER SCIENCE

010. (GH) THE FORMS OF WORLD LITERATURE: A GLOBAL PERSPECTIVE (3:3:0) The development of literature around the world—from epic, legend, lyric, etc., in the oral tradition, to modern written forms.
011. (DH) HEROISM IN WORLD LITERATURE (3:3:0) Cultural values and personal heroism in literary masterworks from a variety of countries and eras.
100. (DH) INTRODUCTION TO COMPARATIVE LITERATURE (3:3:0) Readings from various literatures, organized by themes (utopias, love, the monomyth or heroic quest, etc.) to introduce comparative literary study.
105. (DH) THE DEVELOPMENT OF LITERARY HUMOR (3:3:0) Literary humor expressed as satire, comedy, and farce—from ancient times to the present.
106. (DH) THE ARTHURIAN LEGEND (3:3:0) The legend of King Arthur from medieval Europe to modern Japan; the diverse ideals it has represented in different contexts.
107. (DH) THE LITERATURE OF EXPLORATION: INCREDIBLE VOYAGES FROM ANTIQUITY INTO THE FUTURE (3:3:0) Wanderings amid wonder, from Homer and Lucian and medieval travel legends to Renaissance exploration journals and modern interstellar imaginings.
110. (DH) JEWISH LITERATURE IN EASTERN EUROPE, ISRAEL, AND AMERICA (3:3:0) Literary culture of the Jewish tradition from the Eastern European ghettos to the modern context in Israel and the United States.
111. (DH) LITERATURES OF MODERN INDIA (3:3:0) Sources, achievements, and principal themes of modern Indian poetry and prose; readings in translated or English works of representative authors.
141. (DH) RELIGION AND LITERATURE (3:3:0) Major religious themes as expressed in literary masterpieces; sacred texts from various cultures read as literature.
184. (DH) [ENGL 184 (DH)] THE SHORT STORY (3:3:0) Lectures, discussions, readings in translation, with emphasis on major writers of the nineteenth and twentieth centuries.
185. (DH) [ENGL 185 (DH)] THE MODERN NOVEL IN WORLD LITERATURE (3:3:0) Development of the modern novel in the last century (outside the British Isles and the United States); lectures, discussions, readings in translation.
189. (DH) [ENGL 189 (DH)] THE FOUNDERS OF MODERN DRAMA (3:3:0) Playwrights who set the world's stage for twentieth-century drama: Ibsen, Shaw, Chekhov, and Strindberg.

COMPUTER SCIENCE (CMPSC)

001. BASIC COMPUTER PROGRAMMING (1:0:2) Fundamental characteristics of digital computers; organization and coding of problems for solution on digital computer. Prerequisite: 2 entrance units in mathematics.
100. COMPUTER FUNDAMENTALS AND APPLICATIONS (3:3:0) Introduction to computer fundamentals and applications to data processing environments. Prerequisite: 2 entrance units in mathematics.
101. (GQ) INTRODUCTION TO ALGORITHMIC PROCESSES (3:3:0) Properties of algorithms, languages, and notations for describing algorithms; applications of a procedure-oriented language to problem solving. Students who have passed CMPSC 201 or 203 may not schedule this course. Prerequisite: 2 entrance units in mathematics.
102. COMPUTER ORGANIZATION AND PROGRAMMING (3:3:0) Computer components and organization, representation of numbers and characters, instruction codes, machine language, programming, assembly systems, input-output, subroutines, and macros. Prerequisite: CMPSC 101.
103. (GQ) INTRODUCTION TO PROGRAMMING TECHNIQUES (4:3:2) Design and implementation of algorithms; structured programming; problem-solving techniques; introduction to a high-level, block-structured language, including arrays, procedures, parameters, recursion. Intended for science majors. Students who have passed CMPSC 201 may not schedule this course. Prerequisite: 2 entrance units in mathematics.
120. INTERMEDIATE PROGRAMMING (4:3:2) Systematic programming: top-down program development, documentation, and testing. Verification of program correctness. Introduction to data structures, numerical methods. Prerequisites: CMPSC 101 or 201; MATH 140.
140. INTRODUCTION TO DATA PROCESSING (3:3:0) Applications of digital computers to problems in data processing with examples from accounting, record updating, inventory control, and report generation. Prerequisite: CMPSC 101.
142. PROGRAMMING SYSTEMS FOR SMALL BUSINESS (3:3:0) Business applications programming and systems design applicable to the small business environment. Prerequisite: CMPSC 140.
144. DATA ORGANIZATION AND ACCESSING TECHNIQUES (4:3:2) Design characteristics of external storage devices; record organizations; accessing considerations for sequential, direct, relative, and indexed files; internal data structures. Prerequisites: CMPSC 102, 140.
154. ADVANCED ASSEMBLER, I/O TECHNIQUES, AND JOB CONTROL LANGUAGES (3:3:1) Macro-expansion; assembler-level I/O control; COBOL-assembler linkage conventions; advanced debugging techniques; assembler design; op-system features and JCL techniques. Students may not take both CMPSC 154 and 442 for credit. Prerequisite: CMPSC 144.

164. **CONTEMPORARY TRENDS IN COMPUTER PROGRAMMING (3:3:0)** State of the technology in design, code, test, and documentation techniques for information processing systems and large EDP production programs. Students may not take both CMPSC 164 and 444 for credit. Prerequisite: CMPSC 154.
174. **ANALYSIS AND DESIGN OF INFORMATION SYSTEMS (2:1:2)** The organization, flow charting, programming, debugging, and documentation of a major applied problem in a field of computer application. Prerequisite: third-semester standing.
175. **IMPLEMENTATION OF INFORMATION SYSTEMS (1:0:2)** Implementation and evaluation of an information system as designed in CMPSC 174 with peer review of the design. Prerequisite: CMPSC 174.
201. **(GQ) COMPUTER PROGRAMMING FOR ENGINEERS (3:3:0)** Development and implementation of algorithms in a procedure-oriented language, with emphasis on numerical methods for engineering problems. Students who have passed CMPSC 101 or 203 may not schedule this course. Prerequisite: MATH 141.
203. **(GQ) PRINCIPLES OF PROGRAMMING WITH BUSINESS APPLICATIONS (3:2:2)** Programming in a high-level language. Introduction to networks, data communications, database terminology. Packaged software: statistical, spread-sheet, word/text processing. For business students. Students who have passed CMPSC 101, 103, or 201 may not schedule this course. Prerequisite: 2 entrance units in mathematics.
211. **INTRODUCTION TO SYSTEMS PROGRAMMING (3:2:2)** Review of computer architecture concepts; assembly language programming, I/O routines, linkage and loading; microprocessor and large computer assembly languages. Prerequisite: CMPSC 120. Concurrent: E E 271.

CURRICULUM AND INSTRUCTION (C I)

295. **INTRODUCTORY FIELD EXPERIENCE FOR TEACHER PREPARATION (2-3 per semester, maximum of 6)** Selected observation of schooling situations with small group and tutorial participation. Prerequisite: second-semester standing. Concurrent: EDTHP 115 and/or EDPSY 014.

DIETETIC FOOD SYSTEMS MANAGEMENT (D S M)

100. **THE PROFESSION OF DIETETICS (1:1:0)** Introduction to the profession and exploration of the roles and responsibilities of dietetic professionals.
101. **SANITATION PRACTICES IN FOOD SERVICE OPERATIONS (3:3:0)** Practical applications related to the management of the sanitation subsystem within a food service operation.
103. **FOOD SERVICE MANAGEMENT: THEORY AND PRACTICE (3:3:0)** Professional functions of the food service system, relationships with the nutrition component of food service systems.
205. **HUMAN RELATIONS AND DIETETIC SUPERVISORY SKILLS (3:3:0)** Theories and principles of supervision and training of food service employees for overall operational effectiveness.
250. **QUANTITY FOOD PRODUCTION MANAGEMENT (4:3:1)** Systems approach to managing quantity food production functions in health care settings; included are quantity food production principles and standards.
260. **MANAGEMENT OF FOOD SERVICE OPERATING SYSTEMS (4:3:1)** Major principles related to managing the purchasing, food, and labor subsystems of a health care food service system. Prerequisite: D S M 250.
270. **QUALITY ASSURANCE FOR DIETETIC MANAGEMENT (2:2:0)** Theories, principles, and methods of managing quality dietetic services. Prerequisites: D S M 103, NUTR 252.
295. **PROFESSIONAL STAFF FIELD EXPERIENCE (4:3:1)** Methods of, and practice in, the client-oriented dietetic systems in health care facilities. Prerequisites: D S M 260, 304.
304. **MARKETING OF FOOD SERVICES IN HEALTH CARE FACILITIES (3:3:0)** Theories and applications of marketing principles to the design of consumer-oriented dietetic services.

EARTH SCIENCE (EARTH)

001. **EARTH SCIENCE (3:3:0)** Integrated approach to fundamental problems in the earth sciences. Fields of study include geological sciences, physical geography, and meteorology. No credit will be given for this course if a student takes GEOSC 020, GEOG 019, or METEO 002.
002. **(GN) GAIA—THE EARTH SYSTEM (3:3:0)** An interdisciplinary introduction to the processes, interactions, and evolution of the Earth's biosphere, geosphere, and hydrosphere.

ECONOMICS (ECON)

002. (GS) INTRODUCTORY MICROECONOMIC ANALYSIS AND POLICY (3:3:0) Methods of economic analysis and their use; economic aggregates; price determination; theory of the firm; distribution.
004. (GS) INTRODUCTORY MACROECONOMIC ANALYSIS AND POLICY (3:3:0) National income measurement; aggregate economic models; money and income; policy problems.
014. (GS) PRINCIPLES OF ECONOMICS (3:3:0) Analysis of the American economy, emphasizing the nature and interrelationships of such groups as consumers, business, governments, labor, and financial institutions. Students who have passed ECON 002 or 004 or are registered in the College of Business Administration may not schedule this course.
302. (DS) INTERMEDIATE MICROECONOMIC ANALYSIS (3:3:0) Allocation of resources and distribution of income within various market structures, with emphasis on analytical tools. Prerequisite: ECON 002.
304. (DS) INTERMEDIATE MACROECONOMIC ANALYSIS (3:3:0) Analysis of forces that determine the level of aggregate economic activity. Prerequisite: ECON 004 GS.
315. (DS) LABOR ECONOMICS (3:3:0) Economic analysis of employment, earnings, and the labor market; labor relations; related government policies. Prerequisite: ECON 002 GS.
323. (DS) PUBLIC FINANCE (3:3:0) Contemporary fiscal institutions in the United States; public expenditures; public revenues; incidence of major tax types; intergovernmental fiscal relations; public credit. Prerequisite: ECON 002 GS.
333. (DS) INTERNATIONAL ECONOMICS (3:3:0) Why nations trade, barriers to trade, balance of payments, adjustment and exchange rate determination, Eurocurrency markets, and trade-related institutions. Prerequisite: ECON 002 GS or 004 GS or 014 GS.
336. (DS) ECONOMICS OF DISCRIMINATION (3:3:0) Examination of the economic positions of women and minorities, with analysis of race and sex discrimination and related government policies. Prerequisite: ECON 002 GS.
342. (DS) INDUSTRIAL ORGANIZATION (3:3:0) Industrial concentration, size and efficiency of business firms, market structure and performance, competitive behavior, public policy. Prerequisite: ECON 002.
370. (DS) COMPARATIVE ECONOMIC SYSTEMS (3:3:0) Capitalism, socialism, communism, and fascism; examination of resource allocation, consumption, pricing, production, investment, income distribution, central planning. Prerequisites: ECON 002 GS or 014 GS; 3 additional credits in social science.
372. (DS) SOVIET AND OTHER CENTRALLY PLANNED ECONOMIES (3:3:0) Comparative analysis of resource allocation principles, planning methodologies, investment, industry, agriculture, domestic and foreign trade in centrally planned economies. Prerequisites: ECON 002 GS or 014 GS; 3 credits in related social science.

EDUCATIONAL PSYCHOLOGY (EDPSY)

014. LEARNING AND INSTRUCTION (3:3:0) Psychology of human learning applied toward the achievement of educational goals; evaluation of learning outcomes.
101. (GQ) ANALYSIS AND INTERPRETATION OF STATISTICAL DATA IN EDUCATION (3:3:0) An introduction to quantitative methods in educational research emphasizing the interpretation of frequently encountered statistical procedures.
297. SPECIAL TOPICS (1-9)

EDUCATIONAL THEORY AND POLICY (EDTHP)

115. EDUCATION IN AMERICAN SOCIETY (3:3:0) Introduction to the development of educational institutions, with emphasis on historical, philosophical, and sociological forces.

ELECTRICAL ENGINEERING TECHNOLOGY (EE T)

100. APPLIED ELECTRICITY (2:1:2) Fundamentals of electric circuits; basic principles of electrical machinery and devices; electrical-mechanical analogies; beginning electronics. Prerequisite: MATH 087.
101. FUNDAMENTALS OF ELECTRICAL CIRCUITS (3:3:0) Fundamental theory of resistance, current, voltage. Direct-current concepts from simple series circuits through Thevenin's theorem. Prerequisite or concurrent: MATH 087.

109. **ELECTRICAL CIRCUITS LABORATORY (1:0:2)** Introduction to electrical apparatus, including instruments, their interconnection into basic circuits, observation of circuit behavior, and report writing. Concurrent: EE T 101.
114. **ELECTRICAL CIRCUITS (3:3:0)** Direct-current circuit analysis; introduction to basic magnetism and magnetic circuits; single-phase circuit fundamentals. Prerequisites: EE T 101, MATH 087.
117. **DIGITAL ELECTRONICS (3:3:0)** Fundamentals of digital circuits, including logic circuits, boolean algebra, Karnaugh maps, counters, and registers. Prerequisite: EE T 210.
118. **ELECTRICAL CIRCUITS LABORATORY (2:0:4)** Laboratory study of direct-current networks and alternating-current circuits. Prerequisite: EE T 109. Concurrent: EE T 114.
120. **DIGITAL ELECTRONICS LABORATORY (1:0:2)** Laboratory study of solid state pulse, digital, industrial, and motor control circuits. Prerequisite: EE T 205. Concurrent: EE T 117.
204. **A.C. CIRCUITS (2:2:0)** Application of network theorems, laws, and methods to alternating-current circuits; balanced and unbalanced polyphase systems. Prerequisite: EE T 114.
205. **SEMICONDUCTOR LABORATORY (1:0:2)** Laboratory study of semiconductors. Assembly and tracing of electronic circuits. Concurrent: EE T 210.
206. **A.C. CIRCUITRY LABORATORY (1:0:2)** Laboratory study of alternating-current circuits; assembly and tracing of electrical circuits. Concurrent: EE T 204.
210. **FUNDAMENTALS OF SEMICONDUCTORS (3:3:0)** Semiconductor physics and circuit theory including hybrid parameters; equivalent circuits; power amplifiers and frequency response of small signal amplifiers. Prerequisite or concurrent: EE T 114, MATH 088.
211. **MICROPROCESSORS (4:3:2)** A study of machine language programming, architecture, and interfacing for microprocessor-based systems emphasizing engineering applications and microcomputers. Prerequisite: EE T 117.
213. **FUNDAMENTALS OF ELECTRICAL MACHINES (3:2:2)** Direct-current machinery principles and applications; introduction to machines and basic concepts of laboratory methods related to machinery studies. Prerequisites: EE T 114, 118.
215. **A.C. MACHINERY AND CONTROL (3:3:0)** Alternating-current machinery principles and applications; survey of alternating- and direct-current machinery control methods. Prerequisites: EE T 204, 213.
216. **LINEAR ELECTRONIC CIRCUITS (3:3:0)** Theoretical study of linear electronic devices and circuits, including field effect transistors, integrated circuits, and operational amplifiers. Prerequisite: EE T 210.
219. **A.C. MACHINERY LABORATORY (1:0:2)** Alternators, induction generators, single- and polyphase motors, synchro units, transformers, saturable reactors, and protective devices. Prerequisite: EE T 206. Concurrent: EE T 215.
221. **LINEAR ELECTRONICS LABORATORY (1:0:2)** Laboratory study of transistors; study of differential and operational amplifiers. Emphasis is placed on circuit design. Prerequisite: EE T 205. Concurrent: EE T 216.
297. **SELECTED TOPICS IN ELECTRICAL ENGINEERING TECHNOLOGY (3)** Individual or group work in electrical engineering technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.

ENGINEERING (ENGR)

002. **ENGINEERING ORIENTATION (1:0:2)** Introduction to efficient methods for analyzing and solving engineering problems.
005. **EXPERIMENTAL METHODS FOR ENGINEERS (1:0:2)** Introduction to experimental methods used in engineering. Applications of basic experimental and computational concepts through student involvement in laboratory experiments.

ENGINEERING GRAPHICS (E G)

003. **ARCHITECTURAL GRAPHICS (2:0:6)** Principles of architectural drawing; spatial relationships of points, lines, planes, and solids, with architectural applications; shadows, perspective.
010. **INTRODUCTORY ENGINEERING GRAPHICS (1:0:3)** Multiview projections, pictorial drawings, dimensioning, engineering standards, and working drawings.
011. **ENGINEERING DESIGN GRAPHICS (1:0:3)** Introduction to creative design, space analysis, graphs, graphical mathematics, vector analysis, and design implementation. Prerequisite: E G 010 or 021.
021. **ENGINEERING GRAPHICS FOR MINING (2:0:6)** Drafting techniques, multiview systems, reproductions, pictorials, auxiliaries, sections, space geometry, vectors, with emphasis on inking procedures and skills.
050. **ENGINEERING METHODS AND GRAPHICAL COMMUNICATION (3:1:5)** Introduction to engineering through graphics (multiviews, pictorials, dimensioning, space analysis); microcomputer literacy in BASIC, with computer graphics and instrumentation laboratory.

ENGINEERING GRAPHICS TECHNOLOGY (EG T)

101. TECHNICAL DRAWING FUNDAMENTALS (1:0:2) Technical skills and drafting room practices; fundamentals of theoretical graphics; orthographic projection including sectional and auxiliary views; dimensioning.
102. INTRODUCTION TO COMPUTER-AIDED DRAFTING (1:0:2) A first course presenting an intensive study utilizing a computer-assisted drafting and design system to obtain graphic solutions.
103. SPATIAL ANALYSIS (2:1:2) Spatial relations of points, lines, and solids with applications in engineering technology. Prerequisite: EG T 101.
104. COMPUTER-AIDED DRAFTING (1:0:2) A second course on the more advanced functionality of computer-aided drafting and design systems. Prerequisite: EG T 102.
201. ADVANCED COMPUTER-AIDED DRAFTING (3:1:4) Application of principles of engineering graphics; preparation of working drawings; details, examples, and bill of material using CAD. Prerequisite: EG T 101 or 102.
297. SELECTED TOPICS IN ENGINEERING GRAPHICS (1-3) Individual or group work in engineering graphics offered at certain campuses for second-year students with specific occupational objectives. Prerequisites: third-semester standing.

ENGLISH (ENGL)

001. (GH) UNDERSTANDING LITERATURE (3:3:0) Explores how major fiction, drama, and poetry, past and present, primarily English and American, clarify enduring human values and issues.
002. (GH) THE GREAT TRADITIONS IN ENGLISH LITERATURE (3:3:0) Major works of fiction, drama, and poetry from the Middle Ages to the twentieth century expressing enduring issues and values.
003. (GH) THE GREAT TRADITIONS IN AMERICAN LITERATURE (3:3:0) Major works of fiction, drama, and poetry from the colonial to the modern periods expressing enduring issues and values.
004. BASIC WRITING SKILLS (3:3:0 per semester, maximum of 6) Intensive practice in writing sentences and paragraphs, and instruction in grammar, usage, and punctuation. Designed for students with deficient preparation. *This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program.*
005. WRITING TUTORIAL (1:0:2) Tutorial instruction in composition and rhetoric for students currently enrolled in ENGL 004 or 015. *This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program.*
015. (GWS) RHETORIC AND COMPOSITION (3:3:0) Instruction and practice in writing expository prose that shows sensitivity to audience and purpose. Prerequisite: ENGL 004 or satisfactory performance on the English proficiency examination.
030. (GWS) HONORS FRESHMAN COMPOSITION (3:3:0) Writing practice for especially qualified and screened students. Students who have passed a special writing test will qualify for this course.
050. (DA) INTRODUCTION TO CREATIVE WRITING (3:3:0) Practice and criticism in the reading, analysis, and composition of fiction, nonfiction, and poetry writing.
104. (DH) THE BIBLE AS LITERATURE (3:3:0) Study of the English Bible as a literary and cultural document.
129. (DH) SHAKESPEARE (3:3:0) A selection of the major plays studied to determine the sources of their permanent appeal. Not recommended for English majors.
133. (DH) MODERN AMERICAN LITERATURE TO WORLD WAR II (3:3:0) Eliot, Frost, Faulkner, Fitzgerald, Hemingway, O'Neill, and other writers representative of the years between the world wars.
134. (DH) AMERICAN COMEDY (3:3:0) Studies in American comedy and satire, including such writers as Mark Twain, Faulkner, Vonnegut, and Heller.
139. (DH) BLACK AMERICAN LITERATURE (3:3:0) Fiction, poetry, and drama, including such writers as Baldwin, Douglass, Ellison, Morrison, and Wright.
140. (DH) CONTEMPORARY LITERATURE (3:3:0) Writers such as Barth, Beckett, Bellow, Ellison, Lowell, Mailer, Pinter, Plath, and Vonnegut.
165. (DH) GREAT ENGLISH NOVELS (3:3:0) Introduction to selected major novels by such writers as Defoe, Fielding, Austen, Brontë, Dickens, Hardy, Conrad, Joyce, Lawrence, and Woolf.
167. (DH) POETRY (3:3:0) Introduction to the appreciation and analysis of English and American poetry.
168. (DH) DRAMA (3:3:0) Introduction to the range of dramatic expression in selected plays, primarily English and American.
184. (DH) [C LIT 184 (DH)] THE SHORT STORY (3:3:0) Lectures, discussions, readings in translation, with emphasis on major writers of the classical, medieval, Renaissance, and modern periods.
185. (DH) [C LIT 185 (DH)] THE MODERN NOVEL IN WORLD LITERATURE (3:3:0) Development of the modern novel in the last century (outside the British Isles and the United States); lectures, discussions, readings in translation.
189. (DH) [C LIT 189 (DH)] FOUNDATIONS OF MODERN DRAMA (3:3:0) Playwrights who set the world's stage for twentieth-century drama: Ibsen, Shaw, Chekhov, and Strindberg.

191. **SCIENCE FICTION (3:3:0)** Science fiction as the literature of technological innovation and social change—its development, themes, and problems.
192. **THE LITERATURE OF FANTASY (3:3:0)** Major realms of fantasy in English and American literature: daydream and nightmare, the pastoral, dystopia, utopia, apocalypse, and the heroic.
194. **(DH) WOMEN WRITERS (3:3:0)** Short stories, novels, poetry, drama, and essays by major English and American women writers since 1870.
196. **(AM ST 196) INTRODUCTION TO AMERICAN FOLKLORE (3:3:0)** A basic introduction to verbal and nonverbal folklore, stressing the basic procedures of collection, classification, and analysis.
197. **(AM ST 197) AMERICAN FOLK SONG IN ENGLISH (3:3:0)** British songs in America; native repertoires, white and black; folk ballad; and musical development.
- 202A. **(GWS) EFFECTIVE WRITING: WRITING IN THE SOCIAL SCIENCES (3:3:0)** Instruction in writing persuasive arguments about significant issues in the social sciences. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 or 030; fourth-semester standing.
- 202B. **(GWS) EFFECTIVE WRITING: WRITING IN THE HUMANITIES (3:3:0)** Instruction in writing persuasive arguments about significant issues in the humanities. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 or 030; fourth-semester standing.
- 202C. **(GWS) EFFECTIVE WRITING: TECHNICAL WRITING (3:3:0)** Writing for students in scientific and technical disciplines. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 or 030; fourth-semester standing.
- 202D. **(GWS) EFFECTIVE WRITING: BUSINESS WRITING (3:3:0)** Writing reports and other common forms of business communication. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 or 030; fourth-semester standing.
297. **SPECIAL TOPICS (1-9)**

FINANCE (FIN)

100. **INTRODUCTION TO FINANCE (3:3:0)** The nature, scope, and interdependence of the institutional and individual participants in the financial system. A student may not receive credit toward graduation for both FIN 100 and FIN 301. Prerequisite: third-semester standing.
108. **PERSONAL FINANCE (3:3:0)** Personal management of budgets, bank accounts, loans, credit buying, insurance, real estate, and security buying. May not be scheduled by College of Business Administration students. Prerequisite: third-semester standing.
297. **SPECIAL TOPICS (1-9)**
301. **CORPORATION FINANCE (3:3:0)** The acquisition and management of corporate capital; analysis of operations, forecasting capital requirements, raising capital, and planning profits. Prerequisites: ACCTG 101; ECON 002, 004; MATH 110; Q B A 101.
810. **COMMERCIAL BANK MANAGEMENT (3:3:0)** Managerial processes within the banking industry.

FOOD SCIENCE (FD SC)

105. **(GHS) [S T S 105 (GHS)] FOOD FACTS AND FADS (3:3:0)** Impact on society and the individual of modern food technology, food laws, additives, etc; historical, current, and futuristic aspects.

FORESTRY (FOR)

105. **FOREST MENSURATION (3:2:3)** Measurement of forests and forest products.
106. **FOREST INVENTORIES (3:2:4)** Application of land surveying and sampling techniques, including statistical analysis, for the determination of timber volume and growth.
108. **FIELD STUDIES IN ECOLOGY (1)** Field studies in ecological problems, challenges, and impacts related to normal forest practices in general resource management. Prerequisite: FOR 826.
137. **INTRODUCTION TO HARVESTING (1:0:4)** Field application of harvesting techniques, including sale layout and operation of hand and power equipment.
138. **INTERMEDIATE OPERATIONS (1:0:4)** Field practicum in planting, pruning, and thinning of forest stands. Prerequisite: FOR 137.

FRENCH

140. LETTERING AND DRAFTING (2:0:4) Freehand, mechanical, transfer lettering skills and drafting room practices.
141. FOREST SURVEYING (4:2:8) Plane surveying and mapping techniques as applied to forestry practices. Prerequisite or concurrent: FOR 140, MATH 087.
220. FOREST ECOSYSTEM PROTECTION (3:3:0) Principles and concepts involved in managing the forest ecosystem in regard to fires, insects, and diseases.
221. FOREST FIRE TECHNOLOGY (1:0:3) Technological aspects of controlling and using fire in the forest environment. Prerequisite: FOR 220.
234. RECLAMATION MANAGEMENT (3:2:3) Consideration of various factors of soils, hydrology, and reclamation in the reclaiming and revegetation of disturbed sites. Prerequisite: FOR 141 or 366 or C E 114 or 210.
240. SILVICULTURAL PRACTICES (3:2:3) Principles and techniques of forest establishment, culture, regeneration, and harvesting. Prerequisite: FOR 203 or 250.
241. AERIAL PHOTO INTERPRETATION (4:2:6) Aerial photo interpretation techniques applied to land management inventories, mapping, road location, and procurement. Prerequisites: FOR 203; FOR 105 and 106, or FOR 366.
242. ELEMENTS OF PROJECT SUPERVISION IN FORESTRY (3:3:0) Supervisory techniques developed through an understanding of the behavioral sciences applied to field forestry personnel management.
245. MICROCOMPUTERS IN FORESTRY (2:1:2) Computer literacy; elementary programming in basic and software applications in forestry. Prerequisite: FOR 850 or 3 credits in mathematics.
250. DENDROLOGY (3:0:6) Taxonomy, identification, ranges, and uses of important U.S. timber species and lesser vegetation of a regional nature.
807. FOREST RECREATION (3:2:3) Development, construction, and management of forest recreation areas and facilities. Prerequisite: FOR 141.
808. FOREST PROTECTION (3:2:3) Forest fire prevention, detection, behavior, and suppression; fire plans and statistics; insect and disease control.
814. FORESTRY LEADERSHIP PRACTICUM (1:0:3) Leadership techniques applied to standard forestry field operations. Prerequisite: FOR 242.
817. URBAN FORESTRY (3:2:3) The application of land treatment techniques and forestry practices to urban environments. Prerequisite: FOR 807.
818. INDIVIDUAL STUDIES (1-3 per semester) Individual study of forest technology.
820. ADVANCED FOREST MEASUREMENTS (1) Application of point and 3P sampling methods as a means of developing the database for integrated forest management planning. Prerequisites: FOR 809, 826.
822. FOREST MANAGEMENT SYSTEMS (2) Field projects and an extended field tour dealing with silvicultural, mensurational, and regulation techniques of forest management. Prerequisite: FOR 240.
825. HARVESTING TECHNIQUES (1:0:3) Practical instruction in the operation of heavy equipment used in timber harvesting. Prerequisite: FOR 137.
826. REFORESTATION AND INTERMEDIATE OPERATIONS (1:0:3) Field practicum in planting, pruning, thinning forest stands. Prerequisite: FOR 825.
827. FIELD STUDY PREPARATION (1) Developing practices, procedures, and materials for conducting integrative field studies. Prerequisite: FOR 241.
828. SAWMILL ORIENTATION (1:1:0) An overview of sawmill industry equipment, processes, and products.
829. SAWMILL BUSINESS MANAGEMENT (3:2:3) Fundamental business practices applied to a small sawmill business enterprise. Prerequisite: FOR 828.
830. SAWMILL OPERATION (3:2:3) Technical and applied aspects of sawmilling. Prerequisite: FOR 828.
831. SAWMILL OPERATION PRACTICUM (4) Extended hands-on experience to develop operational competencies in running a small sawmill. Prerequisite: FOR 830.
850. FORESTRY QUANTIFICATION (4:4:0) Principles of quantification applied to natural resources management and surveying.
860. FOREST VALUATION (1) Gathering and analyzing cost and production data related to stumpage valuation and equipment management. Prerequisite: FOR 106.

FRENCH (FR)

001. ELEMENTARY FRENCH I (4:4:0) Grammar, with reading and writing of simple French; oral and aural work stressed. Students who have received high school credit for two or more years of French may not schedule this course for credit without permission of the department.
002. ELEMENTARY FRENCH II (4:4:0) Grammar and reading continued; oral and aural phases progressively increased. Students who have received high school credit for four years of French may not schedule this course for credit without permission of the department. Prerequisite: FR 001.
003. INTERMEDIATE FRENCH (4:4:0) Grammar, reading, composition, oral and aural exercises. Prerequisite: FR 002.
139. (GH) FRANCE AND THE FRENCH-SPEAKING WORLD (3:3:0) An introduction to the culture of France and its impact on the world.

140. FRENCH NOVEL IN ENGLISH TRANSLATION (106) Readings of selected French masterpieces in translation; discussion of recurring themes in several literary periods.
142. (GH) FRENCH LITERATURE IN TRANSLATION (3:3:0) An introduction to the literature of France and French-speaking countries.

GEOGRAPHY (GEOG)

010. (GN) INTRODUCTION TO PHYSICAL GEOGRAPHY (3:2:2) Survey and synthesis of processes creating geographical patterns of natural resources, with application of basic environmental processes in resource management.
020. (GS) HUMAN GEOGRAPHY: AN INTRODUCTION TO MODERN HUMAN GEOGRAPHY (3:3:0) Spatial perspective on human societies in a modernizing world; regional examples; use of space and environmental resources; elements of geographic planning.
100. (DS) ECONOMIC GEOGRAPHY (3:3:0) The location of economic activity at both macro-and micro-regional levels on the Earth's surface.
102. (DH) THE AMERICAN SCENE (3:3:0) How Americans converted wilderness into domesticated landscapes, and how the American scene visibly reflects national and regional cultures.
103. (DS) GEOGRAPHY OF DEVELOPING WORLD (3:3:0) Patterns of poverty in poor countries; conventional and nonconventional explanations; focus on solutions; case studies of specific regions.
110. (DN) CLIMATES OF THE WORLD (3:2:2) Introduction to climatology, including principal processes of the global climatic system and their variation over space and time.
115. (DN) LANDFORMS OF THE WORLD (3:2:2) Distribution of the world's landform features and mineral resources; their characteristics, causes, and significance. Practicum includes correlated field trips and laboratory studies.
120. (DS) URBAN GEOGRAPHY (3:3:0) Urban growth and stagnation; location of cities and urban systems; intraurban spatial structure; contemporary American urban problems.
124. (DS) ELEMENTS OF CULTURAL GEOGRAPHY (3:3:0) Locational analysis of changes in non-Western cultures. Problems of plural societies, economic development, population growth, and settlement.
128. (DS) GEOGRAPHY OF INTERNATIONAL AFFAIRS (3:3:0) Contemporary international affairs in their geographical setting; geographic elements in the development of national power, political groupings, and international disputes.

GEOSCIENCES (GEOSC)

- * 001. PHYSICAL GEOLOGY (3:2:3) Earth processes and their effects on the materials, structure, and morphology of the Earth's crust. Practicum includes field work, study of rocks, minerals, dynamic models, and topographic maps.
- * 020. (GN) PLANET EARTH (3:2:2) Nontechnical presentation of Earth processes, materials, and landscape. Practicum includes field trips, study of maps, rocks, and dynamic models, introduction to geologic experimentation.
- * 021. EARTH HISTORY (3:2:2) Evolution of the Earth; changing patterns of mountains, lowlands, and seas; development of living organisms. Practicum includes field trips, studies of geologic maps, geologic problems, fossils.
040. (GN) THE SEA AROUND US (3:2:2) Introduction to marine science, including physical, chemical, biological, and geological aspects of oceanography; the sea as a multipurpose natural resource.

GERMAN (GER)

001. ELEMENTARY GERMAN I (4:3:2) Listening, speaking, reading, writing; introduction to basic structures and vocabulary through dialogues and literary and cultural readings. Students may receive credit for only one of the following: GER 001, 011, or 015. Students who have received high school credit for two or more years of German may not schedule this course for credit without permission of the department.

*This course includes from one to several field trips for which an additional charge will be made to cover transportation.

HEALTH EDUCATION

002. ELEMENTARY GERMAN II (4:3:2) Listening, speaking, reading, writing; introduction to basic structures and vocabulary through dialogues and literary and cultural readings. Students may receive credit for only one of the following: GER 002, 012, or 016. Students who have received high school credit for four years of German may not schedule this course for credit without permission of the department. Prerequisite: GER 001.
003. INTERMEDIATE GERMAN (4:3:2) Continued skill development; readings consisting of short literary and journalistic writings; increased attention to German cultural context. Students may receive credit for only one of the following: GER 003, 012, or 016. Prerequisite: GER 002.
011. INTENSIVE BASIC GERMAN (6:5:2) Listening, speaking, reading, writing basic structures and vocabulary of German. Taught on an accelerated basis. Students may receive credit for only one of the following: GER 001, 011, or 015.
012. INTENSIVE INTERMEDIATE GERMAN (6:5:2) Continued skill development of structures and vocabulary; listening, speaking, reading, writing. Taught on an accelerated basis. Students may receive credit for only one of the following: GER 002, 003, 012, or 016. Prerequisite: GER 011.
015. READING GERMAN I (3:3:0) Survey of German grammar, with readings in technical prose, for students whose programs permit only two semesters of foreign language. Students may receive credit for only one of the following: GER 001, 011, or 015.
016. READING GERMAN II (3:3:0) Continuation of GER 015, with readings in the student's own field. Students may receive credit for only one of the following: GER 002, 012, or 016. Prerequisite: GER 015.
100. (GH) GERMAN CULTURE AND CIVILIZATION (3:3:0) Life of the German people from the early Middle Ages to modern times; their literature and arts, music, science, and philosophy. Conducted in English.
120. (DH) THE FAUST THEME IN LITERATURE AND IN OTHER ARTS (3:3:0) Survey of the Faust theme in literature (Spiess, Marlowe, Goethe, Mann), book illustrations, music (Gounod), theatre, film, and visual arts. Conducted in English.
150. (GH) MASTERPIECES OF GERMAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Major works and prominent authors, e.g., *Nibelungenlied*, *Tristan*, Lessing, Goethe, Schiller, Heine, Hauptmann, Hesse, Mann, Kafka, Böll, Grass, Frisch.
180. (DH) GOETHE AND HIS CONTEMPORARIES IN ENGLISH TRANSLATION (3:3:0) Major works of Goethe and his contemporaries, especially Schiller, in translation.
190. (DH) TWENTIETH-CENTURY GERMAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Works of such writers as Brecht, Dürrenmatt, Grass, Hesse, Kafka, Mann, Rilke, and Weiss.
195. (DH) MODERN GERMAN DRAMA AND THEATRE (3:3:0) Plays and their stage realization by writers such as Hauptmann, Schnitzler, Wedekind, Kaiser, Brecht, Dürrenmatt, Weiss, Handke, and Fassbinder. Conducted in English.
200. (DH) CULTURE IN EAST AND WEST GERMANY (3:3:0) Major currents and forces present in contemporary German intellectual, educational, social, economic, and political life within the international context. Conducted in English.

HEALTH EDUCATION (HL ED)

003. (GHS) DRUGS IN SPORTS (1:1:0) Nature of drug use, misuse, and abuse in the athletic setting with implications for counseling and controls.
005. (GHS) HEALTH ASPECTS OF SPORT (1:1:0) Basic principles and concepts of safety, health, and fitness for recreation and sport.
013. (GHS) STANDARD FIRST AID, PERSONAL SAFETY, AND CPR (1:1:1) Theoretical and technical aspects of standard first aid, personal safety, and cardiopulmonary resuscitation (CPR).
015. (GHS) LIFE-STYLE FOR BETTER HEALTH (1:1:0) Concepts of health, life-style, and risk factors; development and implementation of personal action plans.
019. (GHS) HEALTH AND DISEASE (1:1:0) Essentials of communicable and chronic disease control.
043. (GHS) DRUGS IN SOCIETY (1:1:0) An exploration of the health-related aspects of drug use and abuse.
044. (GHS) INTRODUCTION TO DEATH EDUCATION (1:1:0) Educational and consumer aspects of dying and death from a health education perspective.
045. (GHS) ALCOHOL AWARENESS EDUCATION (1:1:0) A course designed to raise awareness relative to the use and abuse of beverage alcohol.
046. (GHS) INTRODUCTION TO HEALTH ASPECTS OF HUMAN SEXUALITY (1:1:0) An examination of health concerns related to sexuality and sexual behavior.
048. (GHS) VALUES AND HEALTH BEHAVIOR (1:1:0) An exploration of opinions, beliefs, attitudes, and personal values as they relate to decision making and health behavior.
057. (GHS) CONSUMER HEALTH (1:1:0) Essentials for determining credibility of claims for particular health services and products from a consumer's perspective.
060. (GHS) PRINCIPLES AND PRACTICES OF HEALTHFUL LIVING (3:3:0) Facts and principles as related and applied to the science of living serve as a basis for health instruction and student guidance.

303. (GHS) EMERGENCY CARE (3:2:2) Competencies leading toward certification in Advanced First Aid and Emergency Care and Cardiopulmonary Resuscitation.
384. APPLIED KINESIOLOGY (3:2:2) Study of anatomical structure, body movement. Characteristic muscle action and motion will be analyzed in relation to physical therapy context. Prerequisite: BIOL 029.
800. PHYSICAL THERAPIST ASSISTANT—INTRODUCTION (3:2:2) Orientation to the field of physical therapy, historical background of the profession, professional ethics, medical terminology, and patient transportation techniques.
801. PHYSICAL THERAPIST ASSISTANT—PROCEDURES (4:2:4) General considerations for physical therapy modalities; development of skills and their application; diagnostic testing. Prerequisite: HL ED 800.
802. CLINICAL NEUROSCIENCE (1:1:0) Anatomical and pathological basis of common conditions involving the nervous system, with emphasis on treatment and management techniques. Prerequisites: BIOL 029, HL ED 803.
803. MEDICAL SURGICAL ORIENTATION TO THERAPY (3:3:0) Introduction to medical and postoperative conditions and/or disease states most frequently treated by physical therapy modalities. Prerequisites: BIOL 029, 041, 042.
804. THERAPEUTIC EXERCISE (3:2:2) Introduction to the principles of exercise in the treatment of disease and injury.
805. REHABILITATION (2:2:0) Examination of techniques and practical experience with appliances used in the rehabilitation of the physically disabled.
806. PHYSICAL THERAPIST ASSISTANT—PRACTICUM (10) The practice of physical therapist assistant skills in a clinical setting under the direct supervision of a registered physical therapist. Prerequisites: HL ED 804, 805.
807. TECHNIQUES FOR EFFECTIVE PATIENT INTERACTION (1:1:0) Techniques of interacting with the sick or disabled patient; emphasis will be on enhancing interaction skills. Prerequisite: PSY 002.
808. CLINICAL ORTHOPEDICS (1:1:0) Anatomical and pathological basis of common musculoskeletal conditions, with emphasis on current treatment techniques. Prerequisites: BIOL 029, HL ED 803.

HEALTH POLICY AND ADMINISTRATION (H P A)

101. INTRODUCTION TO HEALTH SERVICES ORGANIZATION (3:3:0) Examination of social, political, economic, historic, and scientific factors in the development and organization of the medical care health services.

HEBREW (HEBR)

010. (GH) JEWISH CIVILIZATION (3:3:0) Life of the Jewish people from Biblical times, emphasizing cultural, religious, and institutional developments.

HISTORY (HIST)

001. (GH) THE WESTERN HERITAGE I (3:3:0) A survey of the Western heritage from the ancient Mediterranean world to the dawn of modern Europe.
002. (GH) THE WESTERN HERITAGE II (3:3:0) A survey of the Western heritage from the dawn of modern Europe in the seventeenth century to the present.
003. (GH) THE AMERICAN NATION: HISTORICAL PERSPECTIVES (3:3:0) Central themes in American history from discovery and settlement to the present.
010. (GH) NON-WESTERN CIVILIZATIONS (3:3:0) Introduction to social, economic, and political evolution of non-Western cultures; responses to the West; modernization and development.
012. (DH) HISTORY OF PENNSYLVANIA (3:3:0) Chronological and topical survey, emphasizing immigration of diverse ethnic groups and religious, political, economic, and social developments, including industrialization and urbanization.
020. (DH) AMERICAN CIVILIZATION TO 1877 (3:3:0) A historical survey of the American experience from its colonial beginnings through the Civil War and Reconstruction.
021. (DH) AMERICAN CIVILIZATION SINCE 1877 (3:3:0) A historical survey of the American experience from the emergence of urban-industrial society in the late nineteenth century to the present.
100. (DH) ANCIENT GREECE (3:3:0) Greek world from the earliest Aegean cultures to the death of Alexander the Great and the beginnings of Hellenistic civilization.
101. (DH) THE ROMAN REPUBLIC AND EMPIRE (3:3:0) History of the Roman Republic and Empire from the origins of Rome to the disintegration of the Empire.

HOTEL, RESTAURANT, AND INSTITUTIONAL MANAGEMENT

105. (DH) THE BYZANTINE EMPIRE (3:3:0) Development of Byzantine civilization from the decline of the Roman Empire to the fall of Constantinople.
107. (DH) [MEDVL 107 (DH)] MEDIEVAL EUROPE (3:3:0) Rise and development of the civilization of medieval Europe from the decline of Rome to 1500.
108. (DH) THE CRUSADES: HOLY WAR IN THE MIDDLE AGES (3:3:0) The social and political history of medieval religious warfare in Europe and the Middle East.
116. (DS) FAMILY AND SEX ROLES IN MODERN HISTORY (3:3:0) Historical perspectives on the Western family since 1500: gender roles, marriage, sexuality, child rearing, and old age; emphasis on United States.
117. (DH) WOMEN IN MODERN HISTORY (3:3:0) Modernization and women: changing images and roles since the mid-eighteenth century in the family, workshop, politics, society; cross-cultural comparisons.
120. (DS) EUROPE SINCE 1848 (3:3:0) Political, social, and ideological developments; origin and impact of two World Wars; totalitarianism and democracy; changing role in the world.
141. (DH) MEDIEVAL AND MODERN RUSSIA (3:3:0) Introductory survey, including political, social, economic, and cultural development of Kievan, Muscovite, and Imperial Russia.
142. (DS) HISTORY OF COMMUNISM (3:3:0) Marxism; Leninism and evolution of the Soviet Union; formation and development of the communist bloc; impact of Chinese Communism.
143. (DH) HISTORY OF FASCISM AND NAZISM (3:3:0) The study of right-wing totalitarianism in the twentieth century, with special emphasis on Fascist Italy and Nazi Germany.
144. THE WORLD AT WAR: 1939–1945 (3:3:0) In-depth study of the origins and conduct of World War II. Political and economic aspects as well as military.
150. COLONIAL PENNSYLVANIA (3:3:0) Development of the colony of Pennsylvania through the war for American independence, covering immigration, economics, politics, religion, and society.
151. (DS) TECHNOLOGY AND SOCIETY IN AMERICAN HISTORY (3:3:0) Development of technology in America from colonial times; its reception and its influence on social, economic, and political life.
152. (DH) THE AFRO-AMERICAN EXPERIENCE (3:3:0) African roots; colonial and revolutionary experiences; slavery and abolitionism; Civil War and reconstruction; accommodation and protest; the new militancy.
154. HISTORY OF WELFARE IN AMERICA (3:3:0) History of the care of dependent people (including children, the aged, mentally ill, unemployed) from colonial times to the present.
155. (DS) AMERICAN BUSINESS HISTORY (3:3:0) The development of business from the planting of the colonies, through the stages of industrialization, to the present.
156. (L I R 156) HISTORY OF THE AMERICAN WORKER (3:3:0) A study of the American worker from the preindustrial era to the present.
158. HISTORY OF AMERICAN IMMIGRATION (3:3:0) The waves of migration to America and an analysis of the resulting minority groups, their reception, assimilation, and persisting identity.
173. (DS) VIETNAM AT WAR (3:3:0) Rise of nationalism and communism: origins of conflict; United States involvement; impact on postwar regional and international politics; contemporary Vietnam.
174. (DH) THE HISTORY OF TRADITIONAL EAST ASIA (3:3:0) Comparative cultural, institutional, and social history of traditional China and Japan to their contact with the industrialized West.
175. (DH) THE HISTORY OF MODERN EAST ASIA (3:3:0) Comparative survey of the internal developments and external relations of China and Japan since their contact with the industrialized West.
178. (DH) LATIN-AMERICAN HISTORY TO 1820 (3:3:0) Conquest of the New World, development of colonial institutions, impact on native cultures, and origins of independence movements.
179. (DH) LATIN-AMERICAN HISTORY SINCE 1820 (3:3:0) Origin, political growth, international relations, and economic status of the Latin-American republics, with emphasis upon present-day conditions.
181. (DH) INTRODUCTION TO THE MIDDLE EAST (3:2:2) Origins of Islamic civilization; expansion of Islam; the Ottoman Empire; the Middle East since 1918.
191. (DH) EMERGING AFRICA (3:3:0) Indigenous African societies; impact of Rome, Islam, and Europe; slave trade; colonialism; nationalism; problems since independence.
195. HISTORY OF CANADA (3:3:0) An integrated survey from French colonial beginnings to modern Dominion status, with special emphasis on relations with the United States.

HOTEL, RESTAURANT, AND INSTITUTIONAL MANAGEMENT (HR&IM)

201. INTRODUCTION TO MANAGEMENT IN THE HOSPITALITY INDUSTRY (2:2:0) Exploration and analysis of management opportunities, functions, methods, and concepts in various segments of the hospitality industry. Concurrent: HR&IM 202.
202. COLLOQUIUM IN HOSPITALITY MANAGEMENT (1–4) Major industry and professional speakers lecture on current issues followed by discussion with students and faculty. Prerequisite or concurrent: HR&IM 201.

- 204. HOTEL AND FOOD SERVICE MERCHANDISING (3:3:0) Merchandising as a system distributing benefits, collecting costs, concerned with motivating consumers. Topics include promotion, menu planning, and research methods.
- 295. ANALYSIS OF FIELD EXPERIENCE I (2:2:0) Directed written and oral analysis of the 500-hour hospitality working experience focusing on the physical and social environment.
- 301. INTRODUCTION TO THE MANAGEMENT OF SERVICES OPERATIONS (3:3:0) An introduction to management principles and concepts used in service operations. For non-HR&IM majors; HR&IM majors will receive no credit.
- 310. FOOD AND BEVERAGE PURCHASING AND SANITATION (3:3:0) Food and beverage purchasing and sanitation principles for hospitality operations.
- 320. PROPERTY AND PHYSICAL PLANT MANAGEMENT (3:3:0) Analysis and management of engineering and maintenance systems, including mechanical, electrical, building, environmental, and energy management. Prerequisite: HR&IM 201.
- 337. FOOD, BEVERAGE, AND LABOR COST CONTROL (3:3:0) Techniques for analyzing and controlling food, beverage, and labor costs in hospitality organizations. Prerequisite: 3 credits in accounting.
- 380. LODGING SYSTEMS MANAGEMENT I (3:3:0) Systems analysis, design, and application for hotel functions, including guest services, reservations, reception, telecommunications, guest-city ledger, and the night audit. Prerequisites: HR&IM 201, ACCTG 101.
- 381. LODGING SYSTEMS MANAGEMENT II (3:3:0) Systems analysis, design, and application for security, housekeeping, and laundry operations management, with additional emphasis on physical design. Prerequisite: HR&IM 380.
- 250. QUANTITY FOOD PRODUCTION ANALYSIS (4) Physical characteristics of principal food product groups considered. Topics include purchasing problems, preparation techniques, quality and cost control.
- 260. HOSPITALITY SUPERVISION SEMINAR (4) Hospitality management topics are discussed with a major emphasis on operations management. Prerequisites: H F S 204, HR&IM 301, 310, 381.
- 270. HOSPITALITY ADMINISTRATION SEMINAR (4) Components of food service systems are identified and studied as separate problems and as a total system. Prerequisite: HR&IM 260.

HUMAN DEVELOPMENT (H DEV)

- 100. INTRODUCTION TO HUMAN DEVELOPMENT (1:1:0) Human development as a process of man-environment transactions, and the relationships of various fields to the study of that process.
- 101. HUMAN GROWTH AND DEVELOPMENT (3:3:0) Factors affecting human development, health, and behavior over the life span: biological, environmental, psychosocial, community, and historical.
- 102. POLICY AND PLANNING FOR HUMAN DEVELOPMENT (3:3:0) Multidisciplinary analysis of concepts and practice in the creation and administration of social interventions for human development.
- 200. EMPIRICAL INQUIRY IN HUMAN DEVELOPMENT (3:2:2) Introduction to methods and philosophy of empirical inquiry applied to problems of human development.
- 395. FIELD PROJECTS (1-2) Independent study and research in a human service program; written and oral summary of rationale, procedures, findings.

HUMANITIES (HUMAN)

- 001. (GH) VALUES OF THE WESTERN CULTURAL HERITAGE (3:3:0) Fundamental values of human experience as expressed in outstanding philosophical and literary works.
- 002. (GH) SHAPING OF THE MODERN MIND (3:3:0) Relevance to the present age of influential literary and philosophical texts illustrative of the principal epochs of Western civilization.
- 021. IDEAS AND ARTS (3:3:0) Interaction of intellectual and aesthetic values from the Renaissance to the present.
- 050. (DH) THE LITERATURE AND LORE OF MINING (3:3:0) Experience and values of mining tradition: survey of the literature and lore, including field experience.
- 088. (DH) AUSTRALIAN/NEW ZEALAND CULTURAL PERSPECTIVES (3:3:0) Australian and New Zealand cultural and social perspectives, with emphasis on the historical development of intellectual, aesthetic, and humanistic values.
- 101. (DH) MODERN SCIENCE AND HUMAN VALUES (3:3:0) Relationships of science to the aspirations, values, and arts of man.
- 102. THE GRAND TOUR: A VISUAL SURVEY OF EUROPEAN HISTORY (3:3:0) A historical interdisciplinary examination of the visual heritage of Italy, France, Germany, Spain, and the British Isles.

INDIVIDUAL AND FAMILY STUDIES (I F S)

129. (DS) INTRODUCTION TO INDIVIDUAL AND FAMILY DEVELOPMENT (3:3:0) Introduction to psychosocial and family development at all stages of the individual and family life cycle.
216. PERSONAL AND INTERPERSONAL SKILLS (3:3:0) Conceptions of life-span personal and interpersonal skill enhancement.
218. FOUNDATIONS OF MARRIAGE (3:3:0) Factors influencing the husband/wife relationship across the life course.
219. FAMILY FINANCIAL MANAGEMENT (3:3:0) How families plan their finances and factors that determine their decisions.
229. (DS) INFANT AND CHILD DEVELOPMENT (3:3:0) Theory, research, and methods of social/behavioral/biological sciences related to developmental processes and interventions during infancy and childhood.
239. (DS) ADOLESCENT DEVELOPMENT (3:3:0) Social, behavioral, and biological development and intervention throughout adolescence.
249. (DS) ADULT DEVELOPMENT AND AGING (3:3:0) Physiological, psychological, and social development and intervention from young adulthood through old age.
297. SPECIAL TOPICS (1-9)
311. INDIVIDUAL AND FAMILY INTERVENTIONS (3:3:0) Survey of individual and family formal and informal intervention efforts; historical and current perspectives and approaches. Prerequisites: I F S 129; 3 credits in social, behavioral, or biological sciences.
315. FAMILY DEVELOPMENT (3:3:0) Family functions over the life course: family from a multidisciplinary perspective, emphasizing adaptation and change. Prerequisites: I F S 129; 3 credits in social, behavioral, or human biological sciences.
327. HUMAN DEVELOPMENT ACROSS THE LIFE SPAN (3:3:0) A review of research and theory on human development across the life span from a multidisciplinary perspective. Prerequisites: I F S 129; 3 credits in social, behavioral, or human biological sciences.
330. OBSERVATION OR EXPERIENCE WITH PRESCHOOL CHILDREN (1-4) Directed observations of, or supervised experience with, preschool children in group or home settings. Prerequisite: I F S 327 or PSY 213.

INDUSTRIAL ENGINEERING (I E)

315. INDUSTRIAL ORGANIZATION AND ADMINISTRATION (3:3:0) Fundamental principles of organization leading to intelligent appreciation of the simpler problems of factory organization and operation. Students registered in Industrial Engineering may not schedule this course.

INDUSTRIAL ENGINEERING TECHNOLOGY (IE T)

101. MANUFACTURING MATERIALS AND PROCESSES (3:3:0) Mechanical properties of materials; primary processing methods for manufacturing; dimensional verification, measurement; ferrous, nonferrous metals; important plastic plus ceramic materials.
102. MANUFACTURING MATERIALS AND PROCESSES LABORATORY (1:0:2) Mechanical properties evaluation, dimensional verification and measurement, laboratory methods, and statistical interpretation of experimental data. Prerequisite or concurrent: IE T 100.
105. ECONOMICS OF INDUSTRY (2:2:0) Internal economics of industrial enterprise, cost factors, and methods of comparing alternate proposals.
109. INSPECTION AND QUALITY CONTROL (3:2:2) Inspection methods and procedures and their applications to control and acceptance sampling based on statistical methods. Prerequisite: MATH 087.
112. MANUFACTURING PROCESSES (3:1:6) Technology related to metal removal/joining/casting; nondestructive testing; hot/cold forming; heat treatment; computer application in manufacturing; engineering measurements. Prerequisite: IE T 101.
215. PRODUCTION DESIGN (3:1:4) Planning and design of tools required for production. Study of advanced technologies in manufacturing, including CNC, robotics, CAD, and CAM. Prerequisites: EG T 201, IE T 112.
297. SPECIAL TOPICS (1-9) Individual or group work in industrial engineering technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.

INSURANCE (INS)

102. PERSONAL INSURANCE PLANNING (3:3:0) Introduction to the principles and practices of personal insurance planning. May not be scheduled by College of Business Administration students. Prerequisite: third-semester standing.
301. RISK AND INSURANCE (3:3:0) Introduction to the principles and methods of handling business and personal risks; emphasis on insurance techniques. Prerequisite: fourth-semester standing.
800. INSURANCE PRINCIPLES (3:3:0) Introductory survey of all lines of insurance for handling business and personal risks.
810. LIFE INSURANCE (3:3:0) The life insurance contracts as methods of treating the problems of premature death and superannuation. Prerequisite: INS 800.
820. PROPERTY AND CASUALTY INSURANCE (3:3:0) Fundamental principles of property and casualty insurance. Prerequisite: INS 800.
830. INSURANCE PRACTICUM (3:3:0) Practical introduction to insurer operations in company and agency offices. Prerequisite: INS 820.

INTERNATIONAL AGRICULTURE (INTAG)

100. (DS) INTRODUCTION TO INTERNATIONAL AGRICULTURE (3:3:0) Survey of agriculture and food production in developing countries; socioeconomic and technical considerations. (*Note:* Write for a further listing of courses in and related to International Agriculture.)

INTERNATIONAL BUSINESS (I B)

862. INTERNATIONAL BUSINESS (3:3:0)

INTERNATIONAL UNDERSTANDING (INT U)

200. (DS) INTERNATIONAL UNDERSTANDING AND WORLD AFFAIRS (3:3:0) Interdisciplinary consideration of international problems, conflict and accommodation; impact of various cultures and ideologies on world affairs and foreign policy. Credit will not be given for both this course and PL SC 014. Prerequisite: third-semester standing.

ITALIAN (IT)

130. (GH) ITALIAN CULTURE AND CIVILIZATION (3:3:0) Italian life from the medieval period to the present: literature, arts, and contemporary problems; Italo-American experience. (In English.)
230. (GH) MASTERPIECES OF ITALIAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Emphasis on works and authors of international importance. Lectures, readings, and written work in English.

LABOR AND INDUSTRIAL RELATIONS (L.I.R.)

100. (DS) INDUSTRIAL RELATIONS (3:3:0) Introductory analysis of the employment relationship and of the interrelated interests of management, workers, unions, and the public.
101. (DS) EMPLOYMENT RELATIONSHIP: LAW AND POLICY (3:3:0) An examination of basic legal principles underlying the employment relationship and their social, political, and economic bases.
102. THEORIES AND FUNCTIONS OF LABOR ORGANIZATIONS (3:3:0) Study of the theory and practice of labor organizations: goals, internal structure and operations, and impact on society.
103. LABOR LAW (3:3:0) A study of legislation affecting labor organizations and their members.
104. (DS) THE PRACTICE OF COLLECTIVE BARGAINING (3:3:0) Study of the factors involved in negotiating labor contracts, the issues, processes, bargaining relationships, and public responsibilities facing the parties.

LANDSCAPE ARCHITECTURE

156. (HIST 156) HISTORY OF THE AMERICAN WORKER (3:3:0) A study of the American worker from the preindustrial era to the present.
296. INDEPENDENT STUDIES (1-18)

LANDSCAPE ARCHITECTURE (LARCH)

- * 003. (GA) THE NATURAL AND HISTORIC LANDSCAPE (3:3:0) Man's changing attitudes toward urban and rural outdoor spaces and their aesthetic and cultural value.
* 060 (GA) HISTORY OF LANDSCAPE ARCHITECTURE (3:3:0) A survey of the historical development of outdoor space in relationship to allied arts from early beginnings to this century.

LINGUISTICS (LING)

001. (GS) THE STUDY OF LANGUAGE (3:3:0) A nontechnical introduction to the study of human language and its role in human interaction. Students who have successfully completed LING 100 may not enroll in LING 001.
100. (GS) FOUNDATIONS OF LINGUISTICS (3:3:0) Systematic study of linguistic structures in a variety of the world's languages; an overview of language and its organization.
102. (DH) INTRODUCTION TO HISTORICAL LINGUISTICS (3:3:0) Language change and linguistic reconstruction; general procedures and techniques used in comparative linguistics; models of languages; linguistic borrowing and influence. Prerequisite: LING 010 or 100.
220. (DS) [PSY 220(DS)] INTRODUCTION TO PSYCHOLINGUISTICS (3:3:0) The learning of language; language development in the child; meaning as a problem for psychology. Prerequisite: PSY 002.

LIBRARY STUDIES (L ST)

110. INFORMATION ORGANIZATION AND RETRIEVAL (3:2:2) Information structure and resources related to search and problem-solving procedures to identify, organize, and locate print and nonprint materials. Prerequisite: ENGL 015 or 030.

MANAGEMENT (MGMT)

100. SURVEY OF MANAGEMENT (3:3:0) Introduction to organizational factors relevant to management processes, including leadership, motivation, job design, technology, organizational design and environments, systems, change. For non-Business students only.
802. SUPERVISORY MANAGEMENT (3:3:0) Preparation for supervisory positions in formal organizations. Emphasis placed on the motivational aspects of the supervisor's job. Prerequisite: MGMT 100.

MANAGEMENT INFORMATION SYSTEMS (M I S)

100. INTRODUCTION TO MANAGEMENT INFORMATION SYSTEMS (3:3:0) Business computer systems and their impact on management decision making. A student cannot receive credit toward graduation for both M I S 100 and M I S 431.
101. MICROCOMPUTER PROGRAMMING IN STRUCTURED BASIC (3:3:0) Introduction to the microcomputer algorithmic process using BASIC as the vehicle to construct computer solutions to common problems.
103. MICROCOMPUTER APPLICATIONS IN BUSINESS (3:3:0) Introduction to current business uses of the microcomputer, including spreadsheets, database management, word processing, and decision-making models.

*Students may take only one course for General Education credit from LARCH 003 or 060.

106. **SPECIALIZED MICROCOMPUTER APPLICATIONS IN BUSINESS (1-6)** Use of the microcomputer in the functional areas of business (e.g., accounting, management, marketing, finance, etc.). Prerequisites: 3 credits in a business administration appropriate functional area; prior written approval of department.
110. **INTRODUCTION TO COBOL (3:3:0)** Fundamentals of structured COBOL programming. Prerequisite: M I S 100.
111. **ADVANCED COBOL (3:3:0)** Advanced structured COBOL programming. Prerequisite: M I S 110.

MARKETING (MKTG)

220. **PERSONAL SELLING (3:3:0)** Principles underlying the sales process and practical application of these principles to selling situations. Studies role of selling in total marketing process. Prerequisite: third-semester standing.
221. **CONTEMPORARY AMERICAN MARKETING (3:3:0)** Social and economic aspects; movement of goods and services from producers to consumers; analysis of marketing functions, systems, and institutions. A student may not receive credit toward graduation for both MKTG 221 and 301. Prerequisite: 3 credits in economics.
801. **PRINCIPLES OF MARKETING (3:3:0)** Prerequisite: MKTG 221.
802. **PROMOTION MANAGEMENT (3:3:0)** The application and management of various forms of persuasive communication with potential customers; personal selling, sales management, advertising, sales promotion. Prerequisite: MKTG 801.
803. **PRINCIPLES OF RETAILING (3:3:0)** Introduction to the management of retailing organizations, with emphasis on decision making. Not open to retailing majors.
804. **PRINCIPLES OF RETAILING SALESMANSHIP (3:3:0)** Principles of selling applied to the retail level of trade; practical application of these principles in various sales situations.
805. **RETAILING I (3:3:0)** An analysis of the management and merchandising policies of various types of retailing institutions.
806. **RETAILING II (3:3:0)** Merchandising, promotion, and control policies of retail store management. Prerequisite: MKTG 805.
807. **INTRODUCTION TO MARKETING RESEARCH (3:3:0)** Managerial aspects of marketing research, with emphasis on practical details of operating a small-scale project. Prerequisites: MKTG 221, Q B A 801.
808. **PRINCIPLES OF EFFECTIVE PURCHASING (3:3:0)** Introduction to the purchasing function in organizations, with emphasis on integration of purchasing activity with other aspects of marketing management. Prerequisite: MKTG 221.
809. **PRODUCT PLANNING AND DEVELOPMENT (3:3:0)** Problems faced by the product or branch manager including those of planning, research, and consumer satisfaction. Prerequisite: MKTG 221.
810. **PRINCIPLES OF INDUSTRIAL MARKETING (3:3:0)** Introduction to the management of industrial marketing strategy. Emphasizes strategic response to industrial marketing opportunities and response to competition. Prerequisite: MKTG 221.

MATERIALS ENGINEERING TECHNOLOGY (MAT T)

200. **MATERIALS LABORATORY PRACTICE (3:1:4)** Introduction to the methods used to prepare microstructures of various materials, measure elevated temperature, and perform physical property tests. Prerequisites: CHEM 012, PHYS 150.
201. **PHYSICAL ANALYSIS OF MATERIALS (3:2:2)** A study of the structures in several classes of materials, manipulation of these structures, and the behavior of these materials. Prerequisites: CHEM 014, MATH 087, MAT T 200.
202. **MATERIALS TESTING (3:1:4)** Instruction in the methods used for the mechanical property testing of materials including test specimen design, procedures, and the statistical evaluation of data. Prerequisite: MATH 087.
203. **MATERIALS PRODUCTION AND PROCESSING I (3:2:2)** Analysis of important materials—production from raw sources, processing into usable forms, and their ranges of physical and mechanical properties. Prerequisites or concurrent: MAT T 200, MAT T 202.
204. **MATERIALS PRODUCTION AND PROCESSING II (3:2:2)** A study of materials from their production, processing, and property selection aspects with visits to several materials-related plants. Prerequisites or concurrent: MAT T 200, MAT T 202.
295. **FIELD PRACTICE (3:1:6)** Practical experience in the materials industries through either work assignment or completion of a cooperative project with a company.
- Note:* These courses are deemed to be of sufficient depth that graduates from the MAT T program may pursue studies in most baccalaureate materials-related programs.

MATERIALS SCIENCE (MATSC)

101. (GN) ENERGY AND FUELS IN SOCIETY (3:3:0) Energy utilization and technological development; energy resources; energy conversion; patterns, problems, and trends in human use of energy. For nontechnical students.

MATHEMATICS (MATH)

004. INTERMEDIATE ALGEBRA (3:3:0) Polynomials, fractions, exponents, radicals, first- and second-degree equations and inequalities, sequences, systems of equations. Limited to students indicating deficiencies on the mathematics (algebra) proficiency examination. *This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program.*

005. (GQ) COLLEGE ALGEBRA I (3:3:0) Polynomial and rational expressions; exponents and radicals; equations and inequalities; functions, relations, and their graphs; exponential and logarithmic functions. Prerequisite: MATH 004 or satisfactory performance on the mathematics (algebra) proficiency examination.

006. (GQ) PLANE TRIGONOMETRY (3:3:0) Trigonometric functions; solutions of triangles; trigonometric equations; identities. Prerequisites: MATH 005 or satisfactory performance on the mathematics (algebra) proficiency examination; 1 unit of geometry.

007. (GQ) COLLEGE ALGEBRA II AND ANALYTIC GEOMETRY (3:3:0) Nonlinear functions and relations; systems of equations and inequalities; zeros of polynomials; complex numbers; sequences; mathematical induction; binomial theorem. Prerequisite: MATH 005 or satisfactory performance on the mathematics (algebra) proficiency examination.

017. (GQ) FINITE MATHEMATICS (3:3:0) Introduction to logic, sets, probability. Prerequisite: 2 units of high school mathematics.

018. (GQ) ELEMENTARY LINEAR ALGEBRA (3:3:0) Matrices and vectors; transformations; systems of linear equations; convex sets and linear programming. Prerequisite: 2 units of high school mathematics.

035. (GQ) GENERAL VIEW OF MATHEMATICS (3:3:0) Survey of mathematical thought in logic, geometry, combinatorics, and chance.

036. (GQ) INSIGHTS INTO MATHEMATICS (3:3:0) Examples of mathematical thought in number theory, topology, theory of symmetry, and chance. Prerequisite: 1 unit of algebra or MATH 004.

087. TECHNICAL MATHEMATICS (5:5:0) Algebraic expressions, exponents, radicals, equations, graphs, systems of equations, trigonometric functions, solution of right triangles, vectors, complex numbers. Prerequisite: MATH 004 or satisfactory performance on the mathematics proficiency examination.

088. TECHNICAL MATHEMATICS AND CALCULUS (5:5:0) Logarithm, inverse trigonometric functions, trigonometric identities, inequalities, series, limits, differentiation, higher order derivatives, implicit differentiation, applications, integration, areas, volumes, differential equations. Prerequisite: MATH 087.

110. (GQ) TECHNIQUES OF CALCULUS I (4:4:0) Functions, graphs, derivatives, integrals, techniques of differentiation and integration, exponentials, improper integrals, applications. Students may take only one course for credit from MATH 110, 140, and 140A. Prerequisite: MATH 005 or satisfactory performance on the mathematics (algebra) proficiency examination.

111. (GQ) TECHNIQUES OF CALCULUS II (2:2:0) Analytic geometry, partial differentiation, maxima and minima, differential equations. Prerequisite: MATH 110.

140. (GQ) CALCULUS WITH ANALYTIC GEOMETRY I (4:4:0) Functions; limits; analytic geometry; derivatives, differentials, applications; integrals, applications. Students may take only one course for credit from MATH 110, 140, and 140A. Prerequisites: MATH 006, 007; or MATH 040; or MATH 041; or satisfactory performance on the mathematics (both algebra and trigonometry) proficiency examination.

140A. (GQ) CALCULUS, ANALYTIC GEOMETRY, ALGEBRA, AND TRIGONOMETRY (6:6:0) Review of algebra and trigonometry; analytic geometry; functions; limits; derivatives, differentials, applications; integrals, applications. Students may take only one course for credit from MATH 110, 140, and 140A. Prerequisite: satisfactory performance on the mathematics (algebra) proficiency examination.

141. (GQ) CALCULUS WITH ANALYTIC GEOMETRY II (4:4:0) Derivatives, integrals, applications; sequences and series; analytic geometry; polar coordinates; partial derivatives. Prerequisite: MATH 140 or 140A.

200. (GQ) NUMBER SYSTEMS (3:3:0) Introduction to sets and logic, properties of the natural numbers, integers, rational and real numbers, algorithms, applications to geometry. For elementary education students only.

220. MATRICES (2:2:0) Systems of linear equations; matrix algebra; eigenvalues and eigenvectors; linear systems of differential equations. Prerequisite: MATH 110 or 140.

230. CALCULUS AND VECTOR ANALYSIS (4:4:0) Three-dimensional analytic geometry; vectors in space; partial differentiation; double and triple integrals; integral vector calculus. Students who have passed either MATH 231 or 232 may not schedule MATH 230 for credit. Prerequisite: MATH 141.

231. CALCULUS OF SEVERAL VARIABLES (2:2:0) Analytic geometry in space; differential and integral calculus of several variables. Students who have passed MATH 230 may not schedule this course. Prerequisite: MATH 141.

232. INTEGRAL VECTOR CALCULUS (2:2:0) Multidimensional analytic geometry; potential fields; flux; Green's divergence and Stokes's theorem. Students who have passed MATH 230 may not schedule this course. Prerequisite: MATH 231.
250. ORDINARY DIFFERENTIAL EQUATIONS (3:3:0) First- and second-order equations; special functions; Laplace transform solutions; higher order equations. Prerequisite: MATH 141.
251. ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS (4:4:0) First- and second-order equations; special functions; Laplace transform solutions; higher order equations; Fourier series; partial differential equations. Prerequisite: MATH 141.
800. BUSINESS MATHEMATICS (3:3:0) Operations with whole numbers, fractions, and mixed numbers, decimals and percent, formulas and equations, percentages and interest, introduction to algebra.

MECHANICAL ENGINEERING TECHNOLOGY (ME T)

100. MECHANISMS (2:0:4) Motion in machine elements; strength and properties of materials; design of machine elements. Prerequisite: MCH T 111.
105. KINEMATICS (3:2:3) Graphical and analytical studies of relative motions, instant centers, velocity and acceleration in plane motions, slider crank mechanisms, cams, gears, gear trains, and flexible connectors. Prerequisite: EG T 101, MCH T 111.
206. MACHINE ELEMENTS AND DYNAMICS (3:2:2) Graphical and analytical study of motion in various mechanisms, including cams, gears, gear trains, and flexible connectors; introduction to kinetics. Prerequisites: EG T 101, MCH T 111. Concurrent: CMPSC 101.
207. HEAT TRANSFER (3:3:0) Basic principles of conduction, convection, and radiation, emphasizing practical applications.
210. PRODUCT DESIGN (3:2:3) Design of machine elements including levers, bearings, shafts, clutches, springs, and gears; selection of ball bearings and belts; design of small mechanical devices. Prerequisites: MCH T 213, ME T 105.
281. ELEMENTARY THERMO- AND FLUID DYNAMICS (4:4:0) Basic problems in compressible fluid flow. Laws of dynamics and thermodynamics, mechanical properties of fluids, elementary heat transfer. Prerequisite or concurrent: MATH 088, PHYS 150.
282. AIR RESOURCE MANAGEMENT (2:2:0) Introduction to air pollution. Pollutants, sources, effects, air monitoring systems, air quality criteria and standards, governmental control programs and procedures.
284. SAMPLING AND MONITORING PROGRAM (2:0:4) Instrumentation and site selection, field data acquisition for major air pollutants, data analysis and evaluation.
297. SELECTED TOPICS IN MECHANICAL ENGINEERING TECHNOLOGY (3) Individual or group work in mechanical engineering technology offered at certain campuses for second-year students with specific occupational objectives. Prerequisite: third-semester standing.

MECHANICAL TECHNOLOGY (MCH T)

110. BASIC MECHANICS (2:2:0) Forces; moments; resultants; equilibrium of force systems; introduction to dynamics. Prerequisite: MATH 087.
111. ELEMENTARY MECHANICS (3:3:0) Forces; moments; resultants; two- and three-dimensional equilibrium of force systems; friction; centroids and moments of inertia of areas. Prerequisite MATH 087. Prerequisite or concurrent: CMPSC 101.
212. INTRODUCTION TO DYNAMICS (3:2:2) Absolute and relative motion related to particles and simple linkages. Force-mass-acceleration, work-energy, and impulse-momentum solution techniques. Prerequisite: MCH T 111. Prerequisite or concurrent: MATH 088.
213. STRENGTH AND PROPERTIES OF MATERIALS (3:3:0) Axial stress and strain; shear; torsion; beam stresses and deflections; combined axial and bending stresses; columns, ductility, resilience, and toughness. Prerequisite: MCH T 111. Concurrent: CMPSC 101.
214. STRENGTH OF MATERIALS LABORATORY (1:0:2) Measurement of mechanical properties of materials; structural testing, data acquisition and analysis; technical laboratory report writing. Concurrent: MCH T 213.

MEDIEVAL STUDIES (MEDVL)

107. (DH) [HIST 107(DH)] MEDIEVAL EUROPE (3:3:0) Rise and development of the civilization of medieval Europe from the decline of Rome to 1500.
108. (DH) MEDIEVAL CIVILIZATION (3:3:0) An interdisciplinary introduction to literature, art, and thought of the Middle Ages.

METEOROLOGY (METEO)

002. (GN) WEATHER AND SOCIETY (2:2:0) Nontechnical treatment of fundamentals of modern meteorology; effect of weather and climate on society and its activities. A student who took METEO 003 for more than 1 credit may not take this course.

003. (GN) INTRODUCTORY METEOROLOGY (3:2:2) Nontechnical treatment of fundamentals of modern meteorology; effect of weather and climate on man and his activities. A student who took METEO 002 may take the laboratory part of this course for 1 credit only.

MICROBIOLOGY (MICRB)

106. (GN) ELEMENTARY MICROBIOLOGY (2:2:0) Importance of microorganisms in public health and disease, agriculture, and industry; descriptive course for nontechnical students.

107. (GN) ELEMENTARY MICROBIOLOGY LABORATORY (1:0:3) Selected techniques with regard to recognition and enumeration of bacteria; effects of chemical and physical agents on microorganisms. Prerequisite or concurrent: MICRB 106.

150. INTRODUCTORY MEDICAL LABORATORY TECHNOLOGY (4:2:10) Introduction to basic principles and procedures of clinical laboratory work. Practicum emphasizes proper collection, handling, and preparation of biological samples. Prerequisite: admission to 2-MLT program.

151. SEMINAR AND PRACTICUM FOR MEDICAL LABORATORY TECHNICIANS (2-17 per semester, maximum of 28) Lectures and laboratory sessions introduce methods and procedures, underlying principles, and their applications in clinical practice. Prerequisites: MICRB 150, 201, 202, CHEM 034, BIOL 041.

Unit A. Clinical Chemistry (7) Basic principles and procedures for measuring chemical components of blood and other body fluids.

Unit B. Clinical Microbiology/Serology (6) Properties and identification of normal and abnormal microbial flora. Antigen-antibody interactions of diagnostic importance.

Unit C. Hematology (6) Red and white blood cell identification and enumeration. Related procedures for diagnosing normal or disease states.

Unit D. Immunohematology (6) Immunologic considerations necessary for the transfusion of blood and blood products.

Unit E. Urinalysis (2) Identification of cellular and crystalline urinary sediments. Qualitative chemical analysis of urine.

201. INTRODUCTORY MICROBIOLOGY (3:3:0) Elementary principles of microbial and viral interrelationships, morphology, and physiology; relation to food, water, soil, industry, and disease processes. Prerequisite: BIOL 101.

202. INTRODUCTORY MICROBIOLOGY LABORATORY (2:0:4) Qualitative and quantitative techniques with regard to recognition of bacteria and their processes on a microscopic, colonial, and physiological basis. Prerequisite: CHEM 012. Prerequisite or concurrent: MICRB 201.

MICROCOMPUTER PROCESSING (MCMP)

240. MICROPROCESSOR INTERFACING (5:4:2) Examination of the devices used in microprocessor systems to communicate with external digital and analog systems. Prerequisite: EE T 210. Concurrent: EE T 211.

241. ADVANCED MICROPROCESSOR SYSTEMS (4:3:2) Development of an understanding of microprocessor principles and systems through a study of current 8- and 16-bit microprocessors. Prerequisite: EE T 211.

242. MICROPROCESSOR SYSTEMS DESIGN AND ANALYSIS (3:1:4) Experience in designing, constructing, and testing a complete microcomputer system and its practical application to control. Prerequisite: EE T 211.

MINERAL PROCESSING (MN PR)

061. INTRODUCTION TO COAL PREPARATION (3:3:0) Theory and application of modern coal preparation practice. Sampling, crushing, sizing, gravity concentration, flotation, dewatering, drying; pollution control; flow-sheets.

MINING (MNG)

023. MINERAL LAND AND MINE SURVEYING (3:0:9) Surveying theory and practice applied to mineral lands and mines; traversing, leveling, mapping, shaft plumbing; stope, room, and development surveying. Prerequisites: E G 011, 1/2 unit of secondary school trigonometry.
030. INTRODUCTION TO MINING ENGINEERING (3:2:3) Examination, development, and exploitation of mineral deposits in case studies of mineral deposits and mines; unit operations, cycling, equipment, methods.

MINING TECHNOLOGY (MNG T)

800. MINING TECHNOLOGY ORIENTATION (1:0:2) Films, slides, and lectures to acquaint the student with the coal mining industry and its impact on society.
801. COAL MINING TECHNOLOGY (3:2:3) Analysis of coal mining systems; integration of unit operations and mining methods for efficient mine production.
802. MINE VENTILATION (3:2:3) Quality and quantity analysis and control of mine atmosphere. Prerequisite or concurrent: CHEM 011, PHYS 150, MNG T 801.
803. STRATA CONTROL (3:2:3) Fundamentals of stresses and strains in rocks; virgin and concentrated stresses; roof support, subsidence, bursts, and stability control. Prerequisite: MCH T 111. Prerequisite or concurrent: MNG T 801.
804. MINE PLANT TECHNOLOGY (3:2:3) Electrical systems in mines; mechanical power applications and materials handling systems. Prerequisite: PHYS 150.
805. MINE SYSTEMS TECHNOLOGY (3:2:3) Quantitative methods of work measurement and their application to production and method study problems related to mines. Prerequisite: MNG T 801.
806. MINE MANAGEMENT AND LAW (3:3:0) The problems of the individual in coal mine management in relation to environment, employer, union, and law.
807. ELECTRICAL MINE MACHINE CIRCUITS (3:2:3) Topics of electrical power fundamentals, power and control circuits, motors and their mine applications will be covered. Prerequisite: MNG T 804.
808. MINE POWER DISTRIBUTION (3:2:3) Topics of high voltage circuits, underground transmission, power stations, power conversion, safety regulations, and power devices will be covered. Prerequisite: MNG T 804.
809. MINE MACHINERY HYDRAULICS (3:2:3) Topics of basic hydraulic principles and their application to mining and mine machinery will be covered. Prerequisites: MATH 087, PHYS 150.
810. MINE MACHINE DYNAMICS (3:2:3) Topics on basic machines and their application to the principles of mine machine operation will be covered. Prerequisites: MCH T 111, PHYS 150.
811. PRACTICUM IN MINE MAINTENANCE (3:0:9) Field and shop techniques in procedures of electrical, mechanical, and hydraulic phases of mine maintenance will be covered. Prerequisites: MNG T 804, PHYS 150.
815. SURFACE MINING TECHNOLOGY (3:2:3) Analysis of surface mining systems; integration of unit operations and equipment utilization for efficient operation. Prerequisite: MNG T 800.
816. ELEMENTS OF SURFACE MINE DESIGN (3:2:3) Exploration methods, pit planning, and design; drilling and fragmentation; loading and haulage systems; and slope stability. Prerequisite: MNG T 815.
817. SURFACE MINING PRODUCTION TECHNOLOGY (3:2:3) Application of time study and work measurement to surface production. Efficiency of equipment usage and equipment utilization scheduling. Prerequisite: MNG T 815.
818. SURFACE MINING HYDROLOGY (3:3:0) Water control and treatment; hydrologic studies before and after mining; impoundments and water treatment. Prerequisites: CHEM 011; GEOSC 001 or 020 or 101.
819. RECLAMATION TECHNOLOGY (3:3:0) Spoil-bank reclamation and contour grading; revegetation and reclaimed land utilization.

MUSIC (MUSIC)

Note: For a complete list of music courses that satisfy General Education program requirements, see the *Penn State Baccalaureate Degree Programs Bulletin*.

005. (GA) AN INTRODUCTION TO WESTERN MUSIC (3:3:0) A general survey of art music in Western society, highlighting important composers and stylistic developments.
008. (GA) RUDIMENTS OF MUSIC (3:3:0) Introduction to the elements of music: notation, scales, meter, rhythm, intervals; basic chord structure. For non-Music majors.

NUCLEAR ENGINEERING TECHNOLOGY (NE T)

201. APPLIED RADIOLOGICAL SAFETY (3:3:0) Discussion of basic radiation dose units, radiation dosimetry, biological effects of radiation, radiation monitoring techniques, government regulations, and radwaste management. Concurrent: NE T 202.
202. REACTOR TECHNOLOGY I (4:4:0) Atomic and nuclear structure, electromagnetic radiation, nuclear radiations, nuclear interactions, and fission. Prerequisite: MATH 088. Concurrent: PHYS 151.
203. APPLIED THERMODYNAMICS (3:3:0) Fundamentals based on first and second laws of thermodynamics; properties of pure substances; vapor cycles for power generation. Prerequisite: MATH 088. Concurrent: PHYS 151.
204. REACTOR TECHNOLOGY II (3:3:0) Survey of various reactor types; neutron diffusion, steady state reactor theory and applications; kinetic behavior of reactors. Prerequisite: NE T 202.
205. NUCLEAR TECHNOLOGY LABORATORY I (2:1:2) Study of radiological safety, radiation measurements, radiation detection instrumentation, and radioactive decay. Prerequisites or concurrent: NE T 201, PHYS 151.
212. NUCLEAR TECHNOLOGY LABORATORY II (3:1:3) Laboratory study of radiation measurements and the diversified application of nuclear techniques and detection systems. Prerequisites: NE T 201, 205.
214. REACTOR TECHNOLOGY LABORATORY (3:1:4) Simulator study of various reactor components and safety systems; emphasis placed upon reactor operation. Prerequisites: NE T 202. Concurrent: NE T 204.
215. APPLIED HEAT TRANSFER (3:3:0) Basic principles of conduction, convection, and radiation. Emphasis placed on nuclear fuel heat removal. Prerequisite: NE T 202. Concurrent: NE T 204.
220. ELECTRICAL GENERATION ORIENTATION (1:1:0) Introduction and comparison of methods of generating electricity; description of the variety of occupations in the electrical generating industry.
221. INTRODUCTORY BOILING WATER REACTOR TECHNOLOGY (1:1:0) Introduction to the concept of commercial power generation of electricity through the use of a boiling water reactor.
222. POWER PLANT QUALITY ASSURANCE/QUALITY CONTROL (1:1:0) Introduction to concepts of quality assurance/quality control; historical development of standards and regulatory guides; specific applications to nuclear plants.
297. SPECIAL TOPICS (1-9) Individual or group work in nuclear engineering technology for students with specific occupational objectives. Prerequisites: third-semester standing.

NUTRITION (NUTR)

100. (GHS) CONTEMPORARY NUTRITION CONCERNS (1:1:0) Interpretation of nutrition principles in relation to contemporary problems in selecting food for growth, development, and health. Students who have received credit for NUTR 150 or 251 may not schedule this course.
150. ELEMENTARY NUTRITION (2:2:0) Fundamentals of nutrition and its relation to human health. Students who have passed NUTR 251 may not schedule this course.
151. NUTRITION COMPONENT OF THE FOOD SERVICE SYSTEM (3:3:0) Introduction to basic nutrition principles and their application in a food service system.
251. (GHS) INTRODUCTORY PRINCIPLES OF NUTRITION (3:3:0) The nutrients: food sources and physiological functions as related to human growth and well-being throughout life; current nutrition issues. Students who have passed NUTR 150 may not schedule this course.
252. DIET THERAPY AND NUTRITION CARE IN DISEASE (4:3:2) Principles of nutrition care to meet therapeutic needs, inpatient care, and rehabilitation. Prerequisites: NUTR 251 or 801.

OPERATIONS MANAGEMENT (OPMGT)

801. PRODUCTION AND OPERATIONS MANAGEMENT (3:3:0) Quantitative tools and techniques used in managing the production function of a firm, including inventory control, production scheduling, capacity planning. Prerequisites: MGMT 100, Q B A 801.

PHILOSOPHY (PHIL)

- * 001. (GH) BASIC PROBLEMS OF PHILOSOPHY (3:3:0) Issues such as the foundations of knowledge, the existence of God, the problem of freedom, and the nature of reality.
- 003. (GH) MORAL VALUES (3:3:0) Freedom, choice, and obligation in conduct; values and the foundations of ethics.
- * 004. (GH) MAJOR FIGURES IN PHILOSOPHY (3:3:0) Introduction to philosophy through the study of the writings of representative thinkers in the history of philosophy.
- 010. CRITICAL THINKING AND ARGUMENT (3:3:0) Principles of correct thinking; deductive and inductive inference; use and misuse of language in reasoning.
- 012. (GQ) ELEMENTS OF SYMBOLIC LOGIC (3:3:0) Translating arguments into symbolic form and establishing validity. For nonscience majors.
- 100. (DH) THE MEANING OF HUMAN EXISTENCE (3:3:0) A study of some philosophical ways of viewing the purpose of life, the good life, and history and its meaning.
- 102. (DH) EXISTENTIALISM (3:3:0) Exploration of a controversial modern mode of philosophizing about life, death, absurdity, and faith.
- 103. (DH) ETHICS AND SOCIAL ISSUES (3:3:0) Ethical issues such as war, privacy, crime and punishment, racism and sexism, civil liberties, affirmative action, abortion, and euthanasia.
- 104. (DH) ETHICS AND THE PROFESSIONS (3:3:0) The philosophical basis for the ethics of professional practice; illustrations include law, business, public administration, journalism, engineering, teaching, medicine.
- 105. INTRODUCTION TO THE PHILOSOPHY OF LAW (3:3:0) Topics normally include concepts of law and responsibility, justice and punishment, legal ethics, and the limits of law.
- 106. BUSINESS ETHICS (3:3:0) A study of ethical issues that confront the business community. Designed primarily for majors in the College of Business Administration.
- 108. (DH) SOCIAL AND POLITICAL PHILOSOPHY (3:3:0) Philosophical analysis of political and communal order; theories of individual and group action within the structures of social obligation.
- 109. (DH) PHILOSOPHY OF ART (3:3:0) Exploration of questions about aesthetic experience, creativity, theories of beauty, principles of criticism in the arts and literature.
- 110. (DH) CONSTRUCTION OF SCIENTIFIC CONCEPTS (3:3:0) The development of scientific concepts, and the relationship of scientific thought and culture.
- 111. (DH) ORIENTAL PHILOSOPHY (3:3:0) Study of philosophical, aesthetic, and religious ideas in the classics of Eastern thought.
- 124. (DH) PHILOSOPHY OF RELIGION (3:3:0) Nature and development of Western religion with interpretation of its significance in contemporary culture. Prerequisite: third-semester standing.
- 205. (DH) ANCIENT PHILOSOPHY (3:3:0) The movements of thought and major thinkers from the pre-Socratics to the neo-Platonists; emphasis on Plato and Aristotle.
- 206. (DH) MODERN PHILOSOPHY (3:3:0) Thinkers from the Renaissance to Kant; empiricism, rationalism, critical philosophy; interaction of philosophy with the revolutions in science, religion, and politics.
- 207. (DH) MEDIEVAL PHILOSOPHY (3:3:0) The movements of thought and major thinkers from the fourth to the fifteenth centuries.
- 212. (GQ) SYMBOLIC LOGIC (3:3:0) The logic of propositions, relations, and quantification; the nature and properties of formal systems. Intended primarily for science-oriented students.
- 218. (DH) CONTEMPORARY PHILOSOPHY (3:3:0) Analysis of the present climate of philosophical thought and its relation to contemporary patterns of culture.
- 221. (DH) PHILOSOPHY OF SCIENCE (3:3:0) An inquiry into the form and function of concepts, laws, theories, and into the character of scientific explanation and prediction.

PHYSICAL EDUCATION (P E)

Physical education courses with the suffix GPE satisfy the physical education portion of the Health Sciences and Physical Education General Education program requirements. For a current list of P E courses, see the *Penn State Baccalaureate Degree Programs Bulletin*.

*Students may take only one course for General Education credit from PHIL 001 or 004.

PHYSICAL SCIENCE (PH SC)

007. PHYSICAL SCIENCE (3:3:0) Development of physics, including modern physical concepts and their relationship to the careers of physical scientists. May not be scheduled by students who have received credit for PHYS 100, 201, 215, or 221.

008. PHYSICAL SCIENCE (3:3:0) Selected concepts of chemistry showing their development, interrelationship, and present status. May not be scheduled by students who have received credit for CHEM 011 or 012.

PHYSICS (PHYS)

001. (GN) THE SCIENCE OF PHYSICS (3:3:0) Historical development and significance of major concepts and theories, with emphasis on the nature of physical science and its role in modern life. For students in nontechnical fields.

150. TECHNICAL PHYSICS (3:2:2) Elementary treatment of topics in mechanics, heat, wave motion, and sound leading toward an understanding of technical applications. Prerequisite: 1-1/2 units of algebra. Prerequisite or concurrent: MATH 087.

151. TECHNICAL PHYSICS (3:2:2) Elementary treatment of topics in electricity, light, and modern physics leading toward an understanding of technical applications. Prerequisite: PHYS 150.

201. (DN) GENERAL PHYSICS (4:4:0) Mechanics. Concurrent: MATH 140.

202. (DN) GENERAL PHYSICS (4:3:2) Electricity and magnetism. Prerequisite: PHYS 201. Concurrent: MATH 141.

203. (DN) GENERAL PHYSICS (3:3:0) Wave motion and thermodynamics. Prerequisite: PHYS 202.

204. (DN) GENERAL PHYSICS (4:3:2) Wave motion and thermodynamics, with laboratory. Prerequisite: PHYS 202.

215. (DN) INTRODUCTORY PHYSICS (4:3:2) Selected topics in mechanics, heat, and sound. Prerequisite: algebra to quadratics.

221. (DN) FUNDAMENTALS OF PHYSICS (4:4:0) Classical and modern physics—mechanics. Designed primarily for science and engineering science majors. Concurrent: MATH 140.

222. (DN) FUNDAMENTALS OF PHYSICS (4:3:2) Classical and modern physics—electricity and magnetism. Designed primarily for science and engineering science majors. Prerequisite: PHYS 201 or 221. Concurrent: MATH 141.

224. (DN) FUNDAMENTALS OF PHYSICS (4:3:2) Classical and modern physics—wave motion and thermodynamics. Designed primarily for science and engineering science majors.

225. (DN) FUNDAMENTALS OF PHYSICS (3:3:0) Classical and modern physics—quantum physics. Designed primarily for science and engineering science majors. Concurrent: PHYS 203 or 204 or 205.

237. INTRODUCTION TO QUANTUM PHYSICS (3:3:0) Relativity and quantum theory applied to selected topics in atomic, molecular, solid state, and nuclear physics. Concurrent: PHYS 203 or 204 or 224.

255. (DN) PHYSICS OF MUSIC AND SPEECH (3:3:0) Descriptive study of vibration and sound waves, hearing and speech, musical instruments, physical bases of harmony and scales.

265. (DN) INTRODUCTORY PHYSICS (4:3:2) Selected topics in light, electricity, and magnetism. Prerequisite or concurrent: PHYS 215.

297. SPECIAL TOPICS (1-9)

POLITICAL SCIENCE (PL SC)

001. (GS) AMERICAN NATIONAL GOVERNMENT (3:3:0) Development and nature of American political culture; constitutional and structural arrangements; policy-making processes; sources of conflict and consensus.

002. AMERICAN PUBLIC POLICY (3:3:0) Examination of selected areas of public policy in America. Analysis of policy content, alternatives, and impact. Prerequisite: PL SC 001.

003. (GS) GOVERNMENT AND POLITICS IN MODERN SOCIETY (3:3:0) Introduction to study of government and politics. Normative and empirical theories; governmental functions in modern communities; representative structures and processes.

014. (GS) INTERNATIONAL RELATIONS (3:3:0) Characteristics of modern nation-states and forces governing their international relations; nationalism; imperialism; diplomacy; current problems of war and peace. Credit will not be given for both this course and INT U 200.

020. COMPARATIVE POLITICS—WESTERN EUROPE (3:3:0) Comparative analysis of political cultures, interest groups, parties, and decision-making processes in principal Western European political systems.

PSYCHOLOGY (PSY)

002. (GS) PSYCHOLOGY (3:3:0) Introduction to general psychology; principles of human behavior and their applications.
015. ELEMENTARY STATISTICS IN PSYCHOLOGY (4:3:2) Frequency distributions and graphs; measure of central tendency and variability; normal probability curve; elementary sampling and reliability; correlations; simple regression equations. Prerequisites: PSY 002; MATH 005 or 2 units of secondary school algebra.
021. CURRENT APPLICATIONS OF PSYCHOLOGY (3:3:0) Topics may be drawn from but not limited to opinion research, selection and placement, behavior modification, attitude measurement and change. Prerequisite: PSY 002.
037. MENTAL HEALTH (3:3:0) Maintaining adjustment, developing a well-balanced personality; behavior disorders and their treatment. May not be used as a prerequisite for any course in Psychology. Not open to Psychology majors or those who have received credit for PSY 437.
170. PSYCHOLOGY OF WOMEN (3:3:0) Psychology of women in historical perspective and present involvement. Stresses women's self-concepts with relation to individual and social psychological health. Prerequisite: PSY 002.
174. (SOC 174) PSYCHOLOGICAL AND SOCIOLOGICAL ASPECTS OF DEATH (3:3:0) An introductory, interdisciplinary approach to the psychology and sociology of death, stressing the significance of, and attitudes toward, mortality. Prerequisites: PSY 002, SOC 001.
202. (DS) INTRODUCTION TO PERCEPTION (3:3:0) Survey of human perception and processing of perceptual information, with some reference to animal literature. Emphasizes vision and audition. Prerequisite: PSY 002.
203. NEUROLOGICAL BASES OF HUMAN BEHAVIOR (3:3:0) An introduction to biopsychology, emphasizing the structure and function of the human brain.
204. (DS) INTRODUCTION TO LEARNING (3:3:0) A general survey of the learning area, including animal and human experiments, with the applicability of learning principles being discussed. Prerequisite: PSY 002.
211. VOCATIONAL BEHAVIOR (3:3:0) Theories of vocational selection and career change; research and application.
213. (DS) INTRODUCTION TO DEVELOPMENTAL PSYCHOLOGY (3:3:0) Developmental principles; physical growth; linguistic, intellectual, emotional, and social development from infancy to maturity. Prerequisite: PSY 002.
220. (LING 220) INTRODUCTION TO PSYCHOLINGUISTICS (3:3:0) The learning of language; language development in the child; meaning as a problem for psychology.
221. (DS) INTRODUCTION TO COGNITIVE PSYCHOLOGY (3:3:0) Introduction to study of such higher mental processes as thinking and reasoning, imagery, concept formation, problem solving, and skilled performance. Prerequisite: PSY 002.
231. (DS) INDUSTRIAL PSYCHOLOGY (3:3:0) Personnel selection, training, accident prevention, morale, and organizational behavior. Prerequisites: PSY 002; PSY 015 or STAT 200.
236. (DS) [RL ST 236 (DS)] PSYCHOLOGIES OF RELIGION (3:3:0) Introduction to major Western psychologies of religion (James, Freud, Jung) and to subsequent extensions of and departures from them.
237. (DS) [RL ST 237 (DS)] RELIGIONS, CULTURES, AND THERAPIES (3:3:0) Comparison of methods and goals of selected religious and secular therapies within their cultural contexts. Prerequisite: PSY 002.
296. INDEPENDENT STUDIES (1-18)

QUANTITATIVE BUSINESS ANALYSIS (Q B A)

101. INTRODUCTION TO QUANTITATIVE BUSINESS ANALYSIS (3:3:0) Introduction to quantitative methods for conceptualizing business and management problems. Prerequisite: MATH 018 or 110.
102. ELEMENTARY BUSINESS STATISTICS (3:3:0) Statistical inference: estimation, hypothesis testing, correlation, and regression; application of statistical techniques to economic and business problems. Prerequisite: Q B A 101.
801. ELEMENTARY BUSINESS STATISTICS (3:3:0) Collection, tabulation, measurement, presentation, and interpretation of quantitative material. Prerequisite: third-semester standing.

RADIOLOGIC TECHNOLOGIST RADIOGRAPHER (R T R)

101. ORIENTATION AND MEDICAL TERMINOLOGY (3:3:9) Radiology history, radiation protection principles, medical ethics, with introduction to medical profession's language.
102. RADIOGRAPHIC POSITIONING I: NURSING PROCEDURES/CONTRAST MEDIA (3:3:9) Basic positional terminology; emphasis on skeleton with introduction to skull; radiological applications of contrast media and nursing pertinent to radiology. Prerequisite: R T R 102.

READING, COMMUNICATION, AND LANGUAGE EDUCATION

103. RADIOGRAPHIC EXPOSURE I: FILM CRITIQUE I (3:4:17) Preliminary exposure factors concerning radiographic imaging; evaluation of radiographic films. Prerequisite: R T R 102.
104. RADIOGRAPHIC POSITIONING II: SPECIAL PROCEDURES (3:3:13) Cranium and body system positioning; invasive contrast procedures pertinent to radiology. Prerequisites R T R 103.
105. RADIOGRAPHIC EXPOSURE II: DARKROOM CHEMISTRY; FILM CRITIQUE II (3:3:13) Continuation of exposure factors concerning radiographic imaging, with emphasis on problem solving, evaluation of radiographs, and radiographic chemistry with processing techniques. Prerequisite: R T R 104.
106. RADIOGRAPHIC POSITIONING III: MEDICAL/SURGICAL DISEASES (3:5:17) Review of skeletal, cranium, and body systems, with emphasis on specialized positioning. Definition of various pathologies pertinent to bodily systems. Prerequisites: R T R 105, BIOL 041.
107. REGISTRY REVIEW I AND II (3:5:17) Registry Review I and II includes material in all required R T R courses, with emphasis upon national board examination. Prerequisite: R T R 106.

READING, COMMUNICATION, AND LANGUAGE EDUCATION (RCLED)

005. COLLEGE READING IMPROVEMENT (3:3:0) Improvement of basic reading skills: vocabulary development; literal and interpretative comprehension; application of these skills more efficiently into college work. Prerequisite: limited to students whose academic profile sheets indicate help in reading is needed.
010. COLLEGE READING IMPROVEMENT II (3:3:0) Development of higher level comprehension, vocabulary, and study skills incorporated into content area reading. Prerequisite: RCLED 005.

REAL ESTATE (R EST)

100. (GH) REAL ESTATE PRACTICE (3:3:0) Study of real estate to enable individuals to make successful transactions and decisions. Not available to baccalaureate students or to those who have taken R EST 301.
301. REAL ESTATE FUNDAMENTALS (3:3:0) Introduction to urban real estate; economic forces affecting property rights; real estate markets and finance; land-use analysis; government policies.
800. REAL ESTATE PRINCIPLES (3:3:0) Nature of the real estate market; introduction to the functions performed in the real estate business.
810. REAL ESTATE SALES (3:3:0) Principles underlying the sale of real estate; the use of selling tools and procedures in the analysis of customers' needs.
830. REAL ESTATE FINANCE (3:3:0) Basic principles of real estate finance; sources of funds for financing real estate.

RELIGIOUS STUDIES (RL ST)

Note: For a complete list of Religious Studies courses that satisfy the General Education program requirements, see the *Penn State Baccalaureate Degree Programs Bulletin*.

001. (GH) INTRODUCTION TO WORLD RELIGIONS (3:3:0) A historical and comparative survey of the principal beliefs and practices of the world's major religions.
003. (GH) INTRODUCTION TO THE RELIGIONS OF THE EAST (3:3:0) Religious experience, thought, patterns of worship, morals, and institutions in relation to culture in Eastern religions.
004. (GH) JEWISH AND CHRISTIAN FOUNDATIONS (3:3:0) Introduction to the perspectives, patterns of worship, morality, historical roots, and institutions of the Judaeo-Christian traditions; their relationships to culture.
140. (DH) RELIGION IN AMERICAN LIFE AND THOUGHT (3:3:0) The function, contributions, tensions, and perspectives of religion in American culture.

RETAILING (RTL)

840. MANAGEMENT IN THE HOME (3:3:0) The principles of decision making, work simplification, use of equipment, and home safety applied to family management.
850. DISPLAY TECHNIQUES (2:1:3) Display as visual communication, emphasizing the techniques related to merchandising and art. Prerequisite: an art or art appreciation course.

RURAL SOCIOLOGY (R SOC)

- * 011. (GS) INTRODUCTORY RURAL SOCIOLOGY (3:3:0) Basic sociological concepts applied to rural societal institutions and change in rural communities, some historical causes and current consequences.

RUSSIAN (RUS)

- 100. (GH) RUSSIAN CULTURE AND CIVILIZATION (3:3:0) The Russian people from the tenth century to present times; their literature, arts, music, science, and philosophy. In English.
- 110. (DH) RUSSIAN FOLKLORE (3:3:0) Study of *byliny*, lyrical and historical songs, folktales, drama, ceremonial poetry, chants, charms, proverbs, and mythology of Russia. In English.
- 120. (DH) THEATRICAL ARTS OF RUSSIA (3:3:0) Survey of Russian dramatic literature, including plays, operas, ballets, and cinema. In English.

SCIENCE, TECHNOLOGY, AND SOCIETY (S T S)

- 100. THE ASCENT OF MAN (3:3:0) A survey of some of the intellectual achievements that highlight mankind's attempts to understand nature and shape the environment.
- 105. (GHS) [FD SC 105 (GHS)] FOOD FACTS AND FADS (3:3:0) Impact on society and the individual of modern food technology, food laws, additives, etc.; historical, current, and futuristic aspects.

SOCIAL SCIENCE (SO SC)

- 001. (DS) URBANIZATION (3:3:0) An overview of the social sciences, including an interdisciplinary analysis of the urban process.
- 002. CONTEMPORARY SOCIETY (3:3:0) Selected contemporary issues in the perspective of history, sociology, psychology, economics, and political science.
- 110. (DS) INTRODUCTION TO CONTEMPORARY AFRICA (3:3:0) Consideration of influences and forces at work; leaders, elites, and groups. Analysis of problems and issues in Africa.
- 297. SPECIAL TOPICS (1-9)

SOCIAL WORK (SOC W)

- 250. (DS) INTRODUCTION TO SOCIAL WORK AND SOCIAL WELFARE (3:3:0) Origins and development of a "caring" philosophy; public and private social welfare programs; social work roles in a changing society. Prerequisite: sophomore standing.

SOCIOLOGY (SOC)

- * 001. (GS) INTRODUCTORY SOCIOLOGY (3:3:0) The nature and characteristics of human societies and social life.
- 003. (GS) INTRODUCTORY SOCIAL PSYCHOLOGY (3:3:0) The impact of the social environment on perception, attitudes, and behavior.
- 005. (GS) SOCIAL PROBLEMS (3:3:0) Current social problems such as economic, racial, and gender inequalities; social deviance and crime; population, environmental, energy, and health problems.
- 007. INTRODUCTION TO SOCIAL RESEARCH (3:3:0) Fundamental concepts and problems in social science research; design, measurement, sampling, causation, validity, interpretation. Prerequisite: 3 credits in sociology.

*Students may take only one course for General Education credit from R SOC 011 or SOC 001.

SPANISH

012. (DS) **CRIMINOLOGY (3:3:0)** Explanations and measurement of crime; criminal law; characteristics of criminals and victims; violent, property, white-collar, organized, and sexual crimes.
013. (DS) **JUVENILE DELINQUENCY (3:3:0)** Juvenile conduct, causes of delinquency, current methods of treatment; organization and function of agencies concerned with delinquency.
015. (DS) **URBAN SOCIOLOGY (3:3:0)** City growth and decline; impact of city life on individuals, families, neighborhoods, and government; urban life-styles.
023. (DS) **POPULATION AND POLICY ISSUES (3:3:0)** Local, national, and international population trends; basic techniques of demographic analysis; population problems; implications for public planning and policy.
- * 030. (DS) **SOCIOLOGY OF THE FAMILY (3:3:0)** Family structure and interaction; functions of the family as an institution: cross-cultural comparisons.
047. (S T S 047) **WILDERNESS, TECHNOLOGY, AND SOCIETY (3:3:0)** Impact of developments in science, literature, and art on changing attitudes toward nature; consequences for conservation, preservation, environmental ethics.
055. (DS) **WORK IN MODERN SOCIETY (3:3:0)** The nature of work in varied occupational and organizational settings; current trends and work life in the future.
110. (DS) **THE SOCIOLOGY OF SEX ROLES (3:3:0)** Changing sex role expectations and behavior for men and women in contemporary society.
119. (DS) **RACE AND ETHNIC RELATIONS (3:3:0)** Historical patterns and current status of racial and ethnic groups; inequality, competition, and conflict; social movements; government policy.

SPANISH (SPAN)

001. **ELEMENTARY SPANISH I (4:4:2)** Audio-lingual approach to basic Spanish; writing. Students who have received high school credit for two or more years of Spanish may not schedule this course for credit without permission of the department.
002. **ELEMENTARY SPANISH II (4:4:2)** Audio-lingual approach to basic Spanish continued; writing. Students who have received high school credit for four years of Spanish may not schedule this course for credit without permission of the department. Prerequisite: SPAN 001.
003. **INTERMEDIATE SPANISH (4:4:2)** Audio-lingual review of structure; writing; reading. Prerequisite: SPAN 002.
010. **INTENSIVE SPANISH (6:5:2)** Basic Spanish grammar; oral, aural, and writing skills. This course is essentially equivalent to SPAN 001, and first half of SPAN 002.
020. **INTENSIVE SPANISH (6:5:2)** Basic and intermediate Spanish grammar, oral, aural, and writing skills. This course is essentially equivalent to the second half of SPAN 002 and all of SPAN 003.
130. (GH) **IBERIAN CIVILIZATION (3:3:0)** Spanish and Portuguese life from the medieval period to the present; literature, the arts, and contemporary problems in historical perspective.
131. (GH) **IBERO-AMERICAN CIVILIZATION (3:3:0)** Spanish American and Brazilian life from the Conquest to the present: literature, art, the indigenous heritage, and contemporary problems.
230. (DH) **MASTERPIECES OF SPANISH LITERATURE IN ENGLISH TRANSLATION (3:3:0)** Emphasis on works and authors of international importance. Lectures, readings, and written work in English.
231. (DH) **MASTERPIECES OF SPANISH AMERICAN LITERATURE IN ENGLISH TRANSLATION (3:3:0)** Emphasis on works and authors of international importance. Lectures, readings, and written work in English.

SPEECH COMMUNICATION (SPCOM)

100. (GWS) **EFFECTIVE SPEECH (3:3:0)** Introduction to speech communication: formal speaking, group discussion, analysis and evaluation of messages.
- Unit A.* Principles of communication, implemented through presentation of speeches, with some attention to group discussion and message evaluation.
- Unit B.* Principles of communication, implemented through group problem solving, with some attention to formal speaking and message evaluation.
- Unit C.* Principles of communication, implemented through analysis and evaluation of messages, with some attention to formal speaking and group discussion.

*Students may take only one course for General Education credit from R SOC 011 or SOC 001.

STATISTICS (STAT)

100. (GQ) STATISTICAL CONCEPTS AND REASONING (3:3:0) Introduction to the art and science of decision making in the presence of uncertainty.
200. (GQ) ELEMENTARY STATISTICS (4:3:2) Descriptive statistics, frequency distributions, probability, binomial and normal distributions, statistical inference, linear regression, and correlation. Prerequisite: 2 units in algebra.
250. (GQ) INTRODUCTION TO BIOSTATISTICS (3:3:0) Statistical analysis and interpretation of data in the biological sciences; probability; distributions; statistical inference for one- and two-sample problems. Prerequisite: MATH 017 or 3 credits of calculus.
301. (GQ) STATISTICAL ANALYSIS I (3:3:0) Probability concepts; nature of statistical methods; elementary distribution and sampling theory; fundamental ideas relative to estimation and testing hypotheses. Prerequisite: 3 credits of calculus.
318. ELEMENTARY PROBABILITY (3:3:0) Combinatorial analysis, axioms of probability, conditional probability and independence, discrete and continuous random variables, expectation, limit theorems, additional topics. Prerequisite: MATH 141.

TELECOMMUNICATIONS (TELCM)

140. INTRODUCTION TO TELECOMMUNICATIONS SYSTEMS (2:2:0) Elements of telecommunications systems, including telephones, transmission lines, switching, digital data, and transmission by microwave, satellite, and fiber optics.
241. SWITCHING AND TRAFFIC (3:3:0) Routing of telecommunications messages: characteristics, methods, and control. Prerequisite: TELCM 140.
242. INTRODUCTION TO TELECOMMUNICATIONS LABORATORY (1:0:2) Techniques used for measurements of basic telecommunications circuits and equipment. Prerequisite or concurrent: TELCM 241.
243. TRANSMISSION (3:3:0) Transmission of telecommunications information, including design problems. Prerequisite: TELCM 140.
244. ADVANCED TELECOMMUNICATIONS LABORATORY (1:0:2) Testing and measurement of advanced telecommunication transmission and switching equipment, including practical alignment and testing of operational systems. Prerequisite or concurrent: TELCM 243.

THEATRE ARTS (THEA)

100. (GA) THE ART OF THE THEATRE (3:3:0) Survey of the history, craft, and art of the theatre to support an informed appreciation of theatrical events.
102. (DA) FUNDAMENTALS OF ACTING (3:3:0) Introduction to performance skills for the student with a general interest in acting.
103. FUNDAMENTALS OF DIRECTING (3:3:0) Training and experience in basic skills of directing. Designed for non-Theatre majors.
104. FUNDAMENTALS OF THEATRE PRODUCTION (3:3:0) Training and experience in basic skills of technical theatre. Designed for non-Theatre majors.
109. (DA) THE DRAMATIC ARTS IN THE MASS MEDIA (3:3:0) The place of television-radio-film drama in our culture; relationship with other art forms; standards of evaluation.
115. (GA) THE POPULAR ARTS (3:3:0) Introduction to the popular arts; common elements and styles.
150. (DA) INTRODUCTION TO THEATRE ARCHITECTURE AND TECHNOLOGY (2:2:1) Introduction to the theatre building, the stage, facilities, artists, technicians, and management.
160. (DA) INTRODUCTION TO COSTUME CRAFTS (2:1:2) Process of costuming combined with laboratory projects. Crew experience on major production.
170. (DA) INTRODUCTION TO STAGE LIGHTING PRODUCTION TECHNIQUES (2:1:2) Introduction to theatre lighting facilities, equipment, and practice. Practical experience with a major production.
180. (DA) INTRODUCTION TO STAGECRAFT (2:2:1) Introduction to methods, materials, and equipment used in scenic construction for the theatre. Practical experience with major production.
210. INTRODUCTION TO CREATIVE DRAMATICS (3:1:4) Introduction and direct experience in creative dramatics and survey of children's theatre.
296. INDEPENDENT STUDIES (1-18)

WILDLIFE (WILDL)

101. INTRODUCTION TO WILDLIFE MANAGEMENT (3:3:0) Basic principles of wildlife management. Introduction to general ecology and wildlife population dynamics.
103. ANIMAL IDENTIFICATION (3:2:3) Identification of mammals, birds, reptiles, and amphibians; introduction to their life histories.
204. WILDLIFE MENSURATION (4:4:0) Estimation and analysis of animal populations and their habitats, including sampling considerations and basic biometry. Prerequisite: 3 credits in mathematics.
207. OUTDOOR RECREATION (3:2:3) Sociology, history, and economics of recreational demand; recreational areas and management procedures.
208. TERRESTRIAL WILDLIFE MANAGEMENT (3:2:4) Ecological characteristics and manipulation of terrestrial habitats; control of wildlife populations. Prerequisites: FOR 240, 250, WILDL 101, 103, 802.
209. ANIMAL HANDLING AND CARE (4:3:3) Techniques in capturing, marking, and maintaining wild animals in captivity. Wildlife physiology, parasitology, and necropsy procedures are covered. Prerequisite: WILDL 101.
211. AERIAL PHOTO INTERPRETATION (4:2:6) Techniques of photo interpretation; type mapping of wildlife environments; photo censusing of wild animals.
213. WETLAND AND FISHERIES MANAGEMENT (3:3:3) Introduction to basic limnology. Ecology and management of swamp, marsh, pond, and stream habitats and their animal populations. Prerequisites: WILDL 101, 103, 204, 802.
802. RECONNAISSANCE SURVEYS (2:1:3) Use of topographic maps and hand-held compasses; survey methods using the staff compass, abney level, steel tape, and pacing. Reconnaissance mapping.
806. OPERATIONAL PROCEDURES AND EQUIPMENT (2:1:3) Operational procedures for wildlife-related equipment and facilities; field trips to wildlife management areas.

WOMEN'S STUDIES (WMNST)

001. (GS) WOMEN'S STUDIES (3:3:0) Interdisciplinary consideration of the scholarly theories and research pertaining to women's experiences and women's status in contemporary American society.

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1991–92

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FALL SEMESTER 1991

AUGUST

- 17 Saturday—Arrival date for new students
- 18 Sunday—Arrival date for returning students
- 20 Tuesday—Registration deadline
- 21 Wednesday—Classes begin

SEPTEMBER

- 2 Monday—Labor Day holiday, no classes⁺

NOVEMBER

- 28, 29 Thursday, Friday—Thanksgiving holiday, no classes

DECEMBER

- 6 Friday—Classes end
- 7, 8 Saturday, Sunday—Study days
- 9–14 Monday to Saturday—Final examinations

JANUARY

- 11 Saturday—Fall commencement

SPRING SEMESTER 1992

JANUARY

- 8 Wednesday—Arrival date
- 10 Friday—Registration deadline
- 13 Monday—Classes begin

MARCH

- 9–13 Spring holiday, no classes

MAY

- 1 Friday—Classes end
- 2, 3 Saturday, Sunday—Study days
- 4–9 Monday to Saturday—Final examinations
- 16, 17 Saturday, Sunday—Spring commencement

SUMMER SESSION 1992

Intercession

MAY

- 11 Monday—Classes begin

JUNE

- 5 Friday—Classes end

Eight-Week Session

JUNE

- 7 Sunday—Arrival date
- 9 Tuesday—Registration deadline
- 10 Wednesday—Classes begin

JULY

- 3 Thursday—Independence Day holiday, no classes[†]

AUGUST

- 5 Wednesday—Classes end
- 6–8 Thursday–Saturday—Final examinations
- 15 Saturday—Summer commencement

Six-Week Session

JUNE

- 24 Wednesday—Classes begin

AUGUST

- 5 Wednesday—Classes end
- 6–8 Thursday to Saturday—Final examinations

⁺Classes that would have met on Monday, September 2, 1991 will meet on Wednesday, December 4, 1991.

[#]Classes that would have met on Thursday, July 4, 1991, will meet on Wednesday, August 7, 1991.

[†]Classes that would have met on Friday, July 3, 1992, will meet on Wednesday, August 5, 1992.

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 • Admission to this program is highly competitive.
 • Second year offered only at McKeesport, New Kensington, Schuylkill, and Worthington Scranton.
 • Second year offered only at Beaver.
 • Second year offered only at Delaware County, McKeesport, and Wilkes-Barre.
 • This program is not currently being offered to entering students.

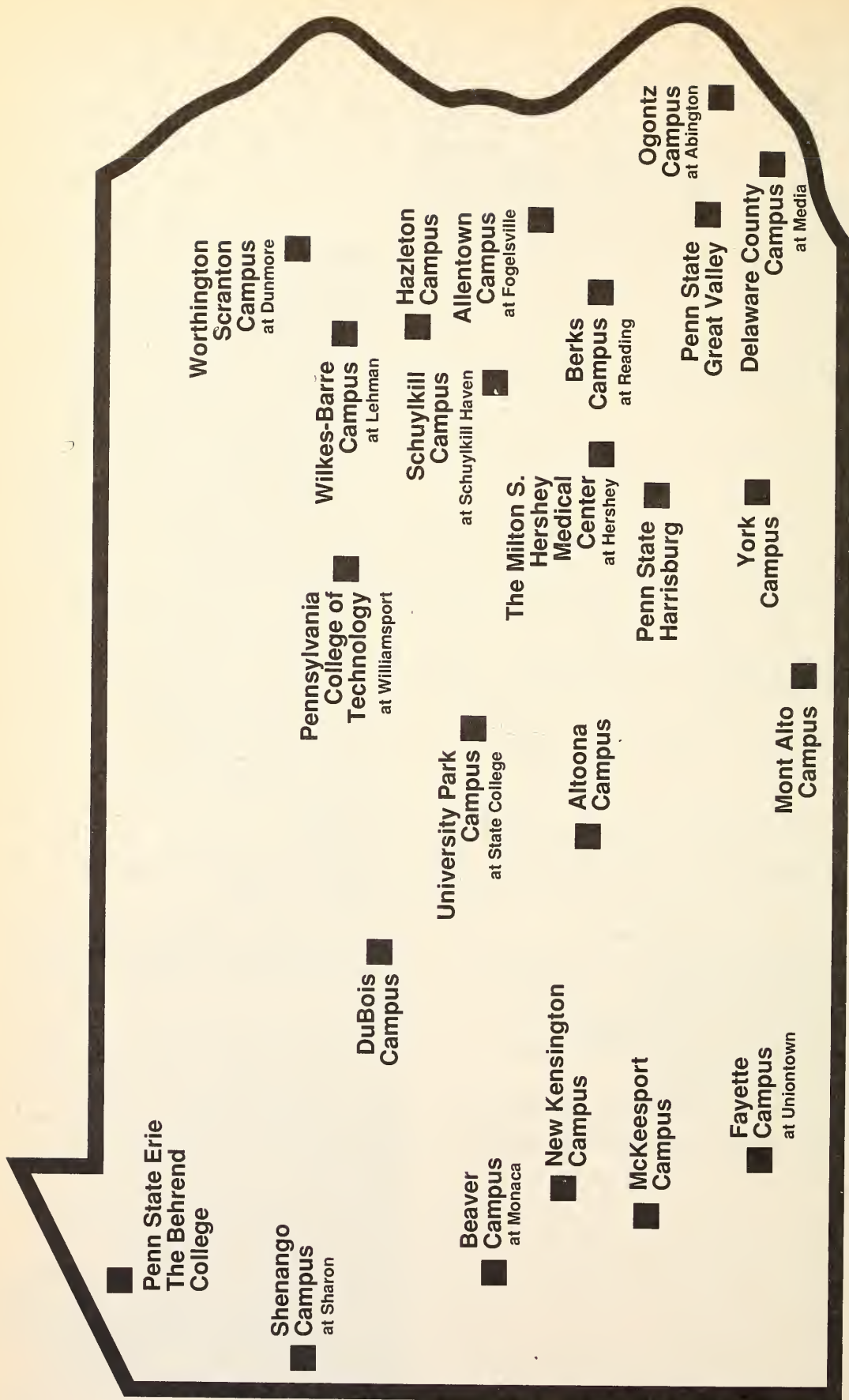
ASSOCIATE DEGREE MAJORS

†The two-year Business Administration major offered at Penn State-Behrend, The Milton S. Hershey Medical Center, Ogontz, and University Park is intended for nontraditional students who want to pursue part-time (primarily evening) study.

††Programs offered at the Medical Center are intended primarily for nontraditional students who want to pursue part-time (primarily evening) study. Interested students should write to Penn State Harrisburg, Continuing Education Credit Program, Route 230, Middletown, PA 17057.

*Human Development and Family Studies, Labor Studies, and Sociology are offered as extended degree programs for students who want to pursue part-time (day or evening) study. Letters, Arts, and Sciences also may be taken as an extended degree program at all University locations. Interested students should write to the Admissions Office or the nearest Penn State campus to request a special application for extended degree programs.

#This program is available primarily through the Department of Independent Learning. Interested students should write to the Undergraduate Admissions Office at University Park, the Continuing Education office at the nearest Penn State campus, or the Department of Independent Learning, The Pennsylvania State University, 128 Mitchell Building, University Park, PA 16802 for more information and to request a special application for extended degree programs.



THE UNIVERSITY

MISSION OF THE UNIVERSITY

Penn State is a comprehensive, multicampus research university serving all regions of the Commonwealth, as well as the nation and the world, in instruction, research, and service roles that require responsiveness to and support from society's public and private sectors.

As a comprehensive land-grant university, Penn State has responsibility for providing a wide array of programs in the professional and technical disciplines as well as a balanced offering of undergraduate and graduate programs in the arts and sciences.

The University shares with other major research universities the traditional responsibilities to discover, develop, preserve, and disseminate knowledge.

Penn State's multicampus delivery system establishes the University as a well-situated provider of continuing education and other public service programs that serve the diverse geographic and economic areas of the state and region.

The more immediate goals of the University grow from its traditions, focus on its strengths, and point to its future opportunities. These goals are summed up by one all-embracing directive: to secure its status among the best public research universities in the nation.

To foster this overall directive, the University sets for itself the following specific goals to guide its planning for the immediate future:

—To make available to qualified students, at a reasonable cost, a selected but wide range of quality undergraduate and graduate educational programs for degree students and for adults concerned with lifelong professional and personal development.

—To improve the intellectual environment and increase the level of financial support necessary to recruit and graduate the highest-quality undergraduate and graduate students, while assuring continuing opportunity for a broad range of qualified students to acquire a Penn State education.

—To transform a significant number of the University's graduate programs from adequacy to excellence, maintaining or enhancing the programs that already are excellent, and strengthening the University's national and international reputation as a graduate institution.

—To enhance, in both quality and quantity, the research enterprise of the University.

—To increase significantly the opportunities for attracting, developing, and retaining faculty who are committed to excellence in teaching and research.

—To enhance the climate for developing interdisciplinary instructional and research programs at both the undergraduate and graduate levels.

—To promote further growth of international programs and services, especially in graduate education and research.

—To extend educational opportunities for Blacks, Hispanics, and other underrepresented groups and generally strengthen the University's affirmative action programs for faculty, staff, and students.

—To use more effectively the University's statewide network of campuses by increasing their diversity in mission, role, and scope of programs.

—To revitalize the University's general education program as part of a broader strengthening of undergraduate education.

RESIDENT INSTRUCTION

The undergraduate degree programs of the University provide students with opportunities to increase their knowledge and understanding of the world, and to grow in their individual skills and capabilities for learning, analyzing, judging, creating, and communicating. All undergraduate degree programs and courses offered by the colleges and other degree-granting units of the University are under the academic sponsorship of a faculty committed to scholarship and are implemented under the academic policies and student rules established by the University Faculty Senate. They are intended to be flexible in accommodating students interested in learning, whether through traditional or nontraditional offerings, while enrolled on either a part-time or a full-time basis. The degree programs and courses of the colleges and other degree-granting units are offered through University administrative arrangements identified as Resident Instruction and Continuing Education.

The primary mission of Resident Instruction is to provide credit courses to degree candidates on University campuses as well as to administer certain off-campus credit-granting activities such as internships, practicums, field trips, and foreign studies. Students not formally admitted to degree candidacy (including provisional and nondegree students) may participate in Resident Instruction offerings as time and space permit.

HISTORY

THE PENNSYLVANIA STATE UNIVERSITY, chartered by the Pennsylvania Legislature as the Farmers' High School in 1855, was founded by professional men, educated farmers, and state and county agricultural leaders. A faculty of four met the incoming class of sixty-nine students in February 1859.

In May 1862, the institution was renamed the Agriculture College of Pennsylvania, a name that recognized that its work was of collegiate level. Two months later, on July 2, President Abraham Lincoln signed the Morrill Land Grant Act, offering each state free public land that it could sell to endow institutions of higher learning where "the leading object shall be . . . to teach such branches of learning as are related to agriculture and the mechanic arts . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

On April 1, 1863, the state legislature declared that the Morrill Act "is hereby accepted by the State of Pennsylvania with all its provisions and conditions and the faith of the State is hereby pledged to carry the same into effect." The legislature then designated Penn State as the land-grant college of the Commonwealth.

The College broadened the scope of its instruction, began to admit female students, increase its enrollment, and enlarge its physical plant. Graduate work was offered as early as 1862. In 1874, the college was renamed the Pennsylvania State College.

In 1953, the name was changed again—to The Pennsylvania State University—in formal recognition of what Penn State had long since become, one of the country's leading universities. Its nine undergraduate colleges and the School of Communications now offer 138 baccalaureate and 24 associate degree majors. Penn State Erie, The Behrend College, offers 21 complete baccalaureate programs. Penn State Harrisburg offers 25 baccalaureate degree majors. Graduate students may choose from 139 approved fields of study. The College of Medicine at The Milton S. Hershey Medical Center in Hershey offers the M.D. degree, the M.S. and Ph.D. in anatomy, bioengineering, biological chemistry, cell and molecular biology, genetics, microbiology and immunology, neuroscience, pharmacology, and physiology, and the M.S. degree in laboratory animal medicine.

The original student body of 69 has grown to 70,978, the faculty of four to 5,019. Beginning with an educational program that offered 40 courses, Penn State today offers 5,336 undergraduate, 3,380 graduate courses, and 195 medical courses. The University, whose prime purpose has always been to serve the people and the interests of the Commonwealth and the nation, is accredited by the Middle States Association and is a member of the Association of American Universities.

ACADEMIC ORGANIZATION OF THE UNIVERSITY

COLLEGES AND OTHER DEGREE-GRANTING UNITS

The University has nine colleges and one school that offer undergraduate majors leading to baccalaureate and associate degrees: College of Agriculture, College of Arts and Architecture, The Mary Jean and Frank P. Smeal College of Business Administration, College of Earth and Mineral Sciences, College of Education, College of Engineering, College of Health and Human Development, College of the Liberal Arts, Eberly College of Science, and the School of Communications. Penn State Erie, The Behrend College, and Penn State Harrisburg provide alternative educational settings in which students may enroll in selected degree programs.

THE COMMONWEALTH EDUCATIONAL SYSTEM

The Commonwealth Educational System is the administrative organization for the University's system of Commonwealth Campuses and for the delivery of Continuing Education programs throughout the Commonwealth. Through the seventeen Commonwealth Campuses and Penn State Great Valley, and the Continuing Education offices at University Park; Penn State Erie, The Behrend College; Penn State Harrisburg; The Milton S. Hershey Medical Center; Lancaster; Monroeville; Towanda; and Williamsport, the Commonwealth Educational System offers a wide array of University courses and programs at locations convenient to virtually all of the population of the Commonwealth. The Commonwealth Campuses and Penn State-Behrend also offer up to two years in most of the four-year baccalaureate degree majors offered by the University.

The Division of Technology of the Commonwealth Educational System, in cooperation with the College of Engineering, is administratively responsible for the associate degree majors in engineering technology offered at the Commonwealth Campuses. The division director is responsible for the coordination and leadership among the college, campuses, and local industry and provides a central advocate for the engineering technology programs.

The University Division of Media and Learning Resources plans, develops, presents, distributes, and evaluates with the University's academic colleges their programs and services that use educational media and other educational technologies in teaching, research, and public service. Its general manager is responsible for leadership of its various units: Independent Learning, WPSX-TV, Audio-Visual Services, and University Photo/Graphics.

COMMONWEALTH CAMPUSES—In addition to the University Park Campus in the municipality of State College, Penn State-Behrend, and Penn State Harrisburg, full-time instruction is available at seventeen Commonwealth Campuses: Allentown (Fogelsville); Altoona; Beaver (Monaca); Berks (Reading); Delaware County (Media); DuBois; Fayette (Uniontown); Hazleton; McKeesport; Mont Alto; New Kensington; Ogontz (Abington); Schuylkill (Schuylkill Haven); Worthington Scranton (Dunmore); Shenango (Sharon); Wilkes-Barre (Lehman); and York.

TWO-YEAR ASSOCIATE DEGREE MAJORS

Majors that lead to two-year associate degrees are available at Penn State-Behrend and all of the University's Commonwealth Campuses except Allentown, as listed previously in this bulletin. These majors provide concentrated instruction to prepare graduates for specialized occupational assignments, except for the Letters, Arts, and Sciences major, which provides graduates with a general education and some specialization in their fields of interest. In addition, a major in Dietetic Food Systems Management is available primarily through the Department of Independent Learning.

More than twenty associate degree majors lead to either the Associate in Arts degree, the Associate in Engineering Technology* degree, or the Associate in Science degree. The majors leading to these degrees are listed below and on the following page.

Associate in Arts Degree

Letters, Arts, and Sciences
Sociology

Associate in Engineering Technology Degree

Architectural Engineering Technology+
Biomedical Equipment Technology+
Building Energy Systems Technology+
Electrical Engineering Technology+
Materials Engineering Technology

Mechanical Engineering Technology+
Microcomputer Engineering Technology
Nuclear Engineering Technology+
Surveying Technology+
Telecommunications Technology+

Associate in Science Degree

Agricultural Business
Business Administration
Computer Science

*Division of Technology, Commonwealth Educational System

+Accredited by TAC/ABET

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Associate in Science Degree (con't)

Dietetic Food Systems Management
Forest Technology
Hotel, Restaurant, and Institutional
Management
Human Development and Family Studies

Medical Laboratory Technology
Nursing
Physical Therapist Assistance
Science
Wildlife Technology

A description of the purposes, objectives, and content of each two-year major is given in the MAJORS section of this *Bulletin*.

Most of Penn State's associate degree enrollment at present is concentrated in its engineering technology majors. Programs that are accredited by the Technology Accreditation Commission, Accreditation Board for Engineering and Technology (TAC/ABET) are indicated. Accreditation applies to each program at campuses where both years of that program are taught. Engineering technology is that part of the technological field that requires the application of scientific and engineering knowledge and methods combined with technical skills in support of engineering activities; it lies in the occupational spectrum between the craftsperson and the engineer at the end of the spectrum closer to the engineer. The engineering technology graduate, a specialist in applied rather than theoretical technology, is equipped to translate creative ideas into new machines, products, structures, and processes.

ADMISSION

STATEMENT OF BASIC ACADEMIC ADMISSION POLICIES—Admission to University credit courses or degree candidacy at The Pennsylvania State University is governed by policies established by the University Faculty Senate. Although specific applications of these policies may vary from year to year, from location to location, and from program to program, all University admissions are governed by the following general policies:

1. As an institution of higher education, The Pennsylvania State University is committed to making post-high school education available to all who possess a high school diploma or its equivalent without restriction as to race, sex, religion, color, ancestry, national origin, ethnic origin, handicap, or age as provided by law.
2. The primary responsibility of the University is to residents of the Commonwealth of Pennsylvania. Consequently, within limits expressed from time to time by the Board of Trustees of the University, preference shall be given to Pennsylvania residents in the various admissions processes.
3. In order to meet the variety of goals and objectives of the population, the spectrum of offerings is designed to enable persons with a variety of objectives—both degree and nondegree—to receive a higher education. Although access to educational opportunities of the University is open to all, courses offered for credit are available to those holding a high school diploma or its equivalent. Policies governing admission to degree candidacy are established by the University Faculty Senate (with delegation of policies governing admissions to graduate programs to the Graduate Faculty of the University) under a general policy of offering admission to those whose past academic performance indicates a reasonable probability of success.
4. Undergraduate students are admitted to either baccalaureate degree candidacy or associate degree candidacy. To be admitted to degree candidacy, the individual must present an academic performance record that indicates a reasonable probability of his or her success in his or her chosen program. In the case of freshman admission to undergraduate degree candidacy, performance is measured through the high school record and standardized test results. In the case of advanced standing admission, performance is measured either through success in nondegree programs and courses of the University or by success at some other institution of higher education.

5. Within the space available in particular programs and at particular locations, admission shall be offered preferentially to those whose performance record indicates the highest probability of success in the chosen program—with this process continuing until all available spaces are filled. Although exceptions to this policy may be made from time to time (for example, recipients of scholarships with restricting qualifications), these exceptions may be made only for students who meet at least the minimum admission and entrance requirements.
6. If a college or school requires restrictions on its baccalaureate admissions, the priorities or targets established must include provisions to consider qualified students in each of these groups:

Admissions Group I—Freshman Admissions: Students who hold a high school diploma or equivalent, who present fewer than 18 credits of baccalaureate work (from The Pennsylvania State University or another regionally accredited institution), who meet minimum college or school entrance requirements, and who meet minimum college or school admission standards.

Admissions Group II—The Pennsylvania State University Advanced Standing Admissions: Students who (1) request baccalaureate degree readmission, presenting 18 or more credits; (2) request a change from The Pennsylvania State University associate degree to baccalaureate degree status, presenting 18 or more applicable credits; or (3) request a change for The Pennsylvania State University provisional degree to baccalaureate degree status, presenting 18 or more applicable credits. In all advanced standing admissions at The Pennsylvania State University, the student must have a G.P.A. of at least 2.00 and must meet the minimum entrance and advanced standing requirements of the college or school.

Admissions Group III—Other Advanced Standing Admissions: Students who (1) request changes from The Pennsylvania State University nondegree to baccalaureate degree status, presenting 18 or more applicable credits; or (2) have not been students at Penn State and request baccalaureate degree status at Penn State, presenting 18 or more applicable credits from a regionally accredited institution. In all advanced standing admissions it is understood that the student must have a G.P.A. of 2.00 as computed at Penn State and meet the minimum entrance and advanced standing requirements of the college or school.

Within these three groups, no special consideration will be given to any group; students will be admitted to the college or school on the basis of academic competition (e.g., SAT scores, grade-point averages, grades in required courses in the college or school, and other evidence predictive of baccalaureate degree performance where available, valid, and reliable).
7. To ensure a proper educational mix of students and to further broaden the educational opportunities offered by the University, the University Faculty Senate and the University administration from time to time may authorize various specialized programs. These programs may permit students who do not meet the basic qualifications for admission to degree candidacy to be admitted to such candidacy. These programs may also permit, in selected situations, exceptional students who have not earned a high school diploma or its equivalent to enroll in University credit courses. Such specialized programs may include up to 10 percent of the total admission group for the University in any one year and up to the maximum of 15 percent of the admission to any geographic location of the University.
8. Within this general policy, the colleges and school of the University, with the concurrence of the University Faculty Senate, may impose certain educational background requirements (Carnegie Units) that must be completed by an individual before being admitted to degree candidacy.

MINIMUM REQUIREMENTS FOR ADMISSION TO DEGREE CANDIDACY—To be eligible for admission consideration to the University as a degree candidate, either as a beginning student or as a student with advanced standing, an applicant must meet the following minimum requirements:

1. Graduation from an accredited secondary school.
2. Completion of the required units of preparatory work as indicated under the heading of Minimum Secondary School Units Required for Admission Consideration in this *Bulletin*.

A secondary school diploma issued by the Pennsylvania Department of Education, or appropriate authority in another state, may be accepted as equivalent to graduation from an accredited secondary school and as equivalent to the minimum secondary school units required for admission, as indicat-

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ed under the Minimum Secondary School Units Required for Admission Consideration heading, with the exception of mathematics and foreign language.

The University accepts the definition of a secondary school unit as established by the Carnegie Foundation. A unit represents a year of work in a subject in a preparatory school or secondary school, provided that the work done in that subject is approximately one-fourth of the total amount of work regularly required in a year in the school.

The University reserves the right to deny admission to any applicant for any reason the University determines to be material to the applicant's qualifications to pursue higher education.

Admission to degree candidacy is specified in terms of enrollment in a college or school of the University or in the Division of Undergraduate Studies. Both for admission to a college or school and for entrance to a major, a student must satisfy the requirements of the University, of the particu-

MINIMUM SECONDARY SCHOOL UNITS REQUIRED FOR ADMISSION
CONSIDERATION FOR ASSOCIATE DEGREE MAJORS

| | English | Math (C)* | Math (D)** | Math (E)*** | Science | Arts/Humanities/ Social Studies/ Foreign Languages |
|---|---------|-----------|------------|-------------|---------|--|
| TWO-YEAR DEGREE MAJORS | | | | | | |
| Agricultural Business | 4 | | | 2 | 2 | 5 |
| Architectural Engineering Technology | 4 | 2 | | | 2 | 5 |
| Biomedical Equipment Technology | 4 | 2 | | | 2 | 5 |
| Building Energy Systems Technology | 4 | 2 | | | 2 | 5 |
| Business Administration (2-year) | 4 | | 2 | | 2 | 5 |
| Computer Science (2-year) | 4 | 2 | | | 2 | 5 |
| Dietetic Food Systems Management | 4 | | | 2 | 2 | 5 |
| Electrical Engineering Technology | 4 | 2 | | | 2 | 5 |
| Forest Technology | 4 | | 2 | | 2 | 5 |
| Hotel, Restaurant, and Institutional Management (2-year) | 4 | | | 2 | 2 | 5 |
| Human Development and Family Studies | 4 | | | 2 | 2 | 5 |
| Letters, Arts, and Sciences | 4 | | | 2 | 2 | 5 |
| Materials Engineering Technology | 4 | 2 | | | 2 | 5 |
| Mechanical Engineering Technology | 4 | 2 | | | 2 | 5 |
| Medical Laboratory Technology | 4 | 2 | | | 2+ | 5 |
| Microcomputer Engineering Technology | 4 | 2 | | | 2 | 5 |
| Nuclear Engineering Technology | 4 | 2 | | | 2 | 5 |
| Physical Therapist Assistance | 4 | | 2 | | 2++ | 5 |
| Science (2-year) (including Biotechnology and Radiologic Technologist Options) | 4 | 2 | | | 2 | 5 |
| Sociology (2-year) | 4 | | | 2 | 2 | 5 |
| Surveying Technology | 4 | 2 | | | 2 | 5 |
| Telecommunications Technology | 4 | 2 | | | 2 | 5 |
| Wildlife Technology | 4 | | 2 | | 2 | 5 |

* Math (C) requirements may be satisfied by at least 2 units of mathematics: 1 unit of algebra and 1 additional unit in any combination of advanced algebra, plane geometry, solid geometry, or trigonometry.

** Math (D) requirements may be satisfied by at least 2 units of mathematics: 1 unit of algebra and 1 additional unit of mathematics. Plane geometry is recommended.

*** Math (E) requirements may be satisfied by any 2 units of mathematics.

+ Students entering Medical Laboratory Technology should have 1 unit each in biology and chemistry.

++ Students entering Physical Therapist Assistance should have 1 unit in biology plus one other science course.

lar college or school, and of the major area. In special circumstances, the University may need to further restrict admission to a college or school and entrance to majors because of space limitations.

FRESHMAN ADMISSION—An applicant for admission as a beginning student in the freshman class must meet the minimum requirements for admission to degree candidacy as stated above prior to the time of matriculation. All offers of admission are conditional until these requirements have been met.

Each applicant is evaluated on the basis of the high school record and results of the Scholastic Aptitude Test (SAT) or American College Test (ACT). This evaluation produces an evaluation index. Admission decisions are made on the basis of a review of the applicant's evaluation index in relation to the requested area of enrollment (academic program), space availability, and the quality of the credentials presented by other applicants.

When openings at the requested location or in the requested program of the University are filled, qualified applicants will be offered admission to their alternate choice of program or location, or notified of campuses where openings still exist.

College Entrance Tests—All applicants for freshman admission to the University are required to submit scores of the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board or the American College Test (ACT). SAT or ACT results of the junior-year testing periods are recommended. The SAT is preferred.

Changing the Area of Enrollment—An applicant who has been admitted to an associate degree major may not change to another without satisfying entrance requirements of the college and major to which he or she wants to transfer.

Previous Attendance at Another College—An applicant must state on his or her application whether he or she has ever attended any other college or university. Failure to indicate, at the time of application, previous registration at another college or university may result in refusal or cancellation of admission. An applicant who has attempted fewer than 18 semester credits at another regionally accredited college or university will be considered as a freshman applicant. An applicant who has attempted 18 or more credits at another regionally accredited college or university subsequent to high school graduation will be evaluated as an advanced standing applicant.

Obtaining an Application—An application can be obtained by writing to the Undergraduate Admissions Office, The Pennsylvania State University, 201 Shields Building, Box 3000, University Park, PA 16802 (telephone: (814) 865-5471), or by contacting an admissions officer at any University location.

ADVANCED STANDING ADMISSION—An applicant who has attended any regionally accredited college or institution on the college level and attempted 18 or more semester credits subsequent to high school graduation may be considered for admission with advanced standing. Attendance at any other institution must be reported at the time of application. Failure to indicate, at the time of application, previous registration at another college or university may result in refusal or cancellation of admission.

An applicant for admission with advanced standing must meet the minimum secondary school requirements for admission to degree candidacy as stated above prior to the time of matriculation. Advanced standing applicants are considered for admission on the basis of the applicant's requested academic program, space availability, and the academic quality of their work at the previously attended institution(s). A minimum cumulative average of at least 2.00 (C) out of 4.00, as computed for Penn State students, is required, although certain areas of study may have additional requirements. In addition, an applicant must be in good academic and nonacademic standing.

Advanced standing credits may be awarded for work taken at regionally accredited institutions provided the grade earned is equivalent to a grade of A, B, or C at this university, and the credits are useful to the student's program of study. An academic adviser determines which of the transferable credits are applicable to the program of study at Penn State. Credits are transferred, but grades and grade points are not. Advanced standing students enter the University without an average, and their average begins with the completion of their first semester of study at Penn State.

Associate degree programs have a limit on the number of credits that may be accepted by transfer

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from regionally accredited institutions. Information about credit limitations may be obtained from the academic official responsible for a particular program.

In certain circumstances, the University may need to restrict advanced standing admissions to particular programs because of space limitations.

Application Procedure—An application can be obtained by writing to the Undergraduate Admissions Office, The Pennsylvania State University, 201 Shields Building, Box 3000, University Park, PA 16802 (telephone (814) 865-5471), or by contacting an admissions officer at any University location. In all cases where work has been taken at other institutions, an official transcript from each place of attendance must be submitted directly to the Undergraduate Admissions Office by the registrar of the institution attended. An applicant currently attending another institution also must provide a schedule of courses in progress or to be completed before enrollment at Penn State, including course name, number, description, and number of credits. The Undergraduate Admissions Office may require the student to send a catalog showing the courses that he or she has taken at the college previously attended. The applicant's secondary school record must be submitted directly to the Undergraduate Admissions Office by the school. All credentials become part of the permanent records of the University.

Changing the Major of Enrollment—An applicant who has been admitted to an associate degree major may not change to another without satisfying entrance requirements of the college and major to which he or she wants to transfer.

PROVISIONAL STUDENT (DEGREE-SEEKING)—An applicant seeking to pursue a degree program and holding a high school diploma or its equivalent but without the criteria required for admission as a degree candidate may enroll in credit courses at the University. A provisional student may enroll in credit courses if the following criteria are met:

1. The student is making satisfactory progress toward admission as a degree candidate. Progress is satisfactory if a student has completed 18 credits with a minimum cumulative grade-point average of 2.00 (on a 4.00 scale). If a student has completed 18 credits and earned less than a 2.00 cumulative grade-point average, the student is given a warning. A student who has completed 27 credits with a cumulative grade-point average of less than 2.00 will not be permitted to enroll as a provisional student in any subsequent semester, unless the student earned more than a 2.00 grade-point average in the most recently completed semester. No student, regardless of cumulative grade-point average, who has completed 36 credits will be permitted to enroll as a provisional student in any subsequent semester.
2. There is space available after degree candidates have been accommodated.
3. The student has not been dropped for unsatisfactory scholarship from any college or university previously attended.
4. The student has not been dismissed or suspended for nonacademic reasons from any college or university. An applicant not in good standing at another accredited college or university for disciplinary reasons must consult with the Director of the Office of Conduct Standards for admissions clearance.

Obtaining an Application—An application can be obtained by writing to the Undergraduate Admissions Office, The Pennsylvania State University, 201 Shields Building, Box 3000, University Park, PA 16802 (telephone (814) 865-5471), or by contacting an admissions officer at any University location.

Admission of a Provisional Student as a Degree Candidate—A provisional student may apply for admission as an associate degree candidate after completing 9 credits of Penn State course work with a minimum cumulative grade-point average of 2.00. The applicant also must satisfy the entrance requirements of either the major in which enrollment is desired or of the Division of Undergraduate Studies if the student wishes to enroll in that division. An applicant who has completed at least the equivalent to one year of associate degree work before applying for admission as an associate degree candidate must have the approval of either the dean of the college or school in

which enrollment is requested or of the director of the Division of Undergraduate Studies if the student wishes to enroll in that division. Under certain circumstances, the University may need to restrict admission to degree candidacy in a particular college, school, or major because of space limitations. Provisional students should work with their advisers and utilize current information about academic requirements and restrictions in planning their programs of study toward admission to degree candidacy. After a student is admitted as a degree candidate, the dean of the college or school of enrollment decides which credits earned as a provisional student may be used to fulfill the degree requirements.

NONDEGREE STUDENT—Any person having received a high school diploma or its equivalent may be permitted to enroll in credit courses (either for credit or audit) at the University. Some of these persons will be classified as nondegree students.

A nondegree student who has not been dropped from degree or provisional status by this university or any other college or university for unsatisfactory scholarship will be listed as a nondegree-regular student and may enroll in any number of credits not to exceed the typical credit load of a full-time student per semester if criteria 1, 2, and 3 (on the following list) are met.

A nondegree student who has been dropped from degree or provisional status by this university or any other college or university because of unsatisfactory scholarship will be listed as a nondegree-conditional student and may enroll in a maximum of 10 credits per semester if criteria 1, 2, 3, and 4 (on the following list) are met.

1. The student has completed the prerequisite for the courses to be scheduled or has obtained permission from the instructor to schedule the course.
2. Space is available after degree candidates and provisional students have been accommodated.
3. The student has not been dismissed or suspended for nonacademic reasons from any college or university. An applicant not in good standing at another college or university for disciplinary reasons must consult with the director of the Office of Conduct Standards for admission clearance.
4. The student has obtained academic advising/counseling from an adviser/counselor designated by the academic unit to which admission, or reinstatement and readmission, is desired.

Note: A student must be admitted, or reinstated and readmitted, as a degree candidate to apply the credits earned as a nondegree student toward fulfilling the requirements for a degree. The dean of the college or school of enrollment shall decide which credits may be used to fulfill the degree requirements.

Obtaining an Application—An application can be obtained by writing to the Undergraduate Admissions Office, The Pennsylvania State University, 201 Shields Building, Box 3000, University Park, PA 16802 (telephone: (814) 865-5471), or by contacting an admissions officer at any University location.

Admission of Nondegree Student as a Degree Candidate—A nondegree student may apply for admission as an associate degree candidate upon completion of at least 9 credits earned at this University with at least a 2.00 cumulative grade-point average. An applicant who has completed at least the equivalent of one year of associate degree work before applying for admission as an associate degree candidate must have the approval of the dean of the college or school in which enrollment is requested. To be eligible for degree admission, the nondegree student must meet the academic requirements of the University and the college or school in effect at the time of application. Under certain circumstances, the University may need to restrict admissions to degree candidacy or entrance to particular majors because of space limitations. After a student is admitted as a degree candidate, the dean of the college or school of enrollment decides which credits earned as a nondegree student may be used to fulfill degree requirements.

PROGRAMS FOR NEW STUDENTS

The Office of Undergraduate Information and Communications provides freshmen at all Penn State campuses, as well as advanced standing and change-of-assignment students at University Park, with a comprehensive introduction to the essential academic and student development opportunities of the campus and the University in general beginning with a new student's acceptance to a campus and continuing through completion of the new student's first semester.

Through programs offered in cooperation with the colleges' academic units and various student service operations, new students are introduced to the intellectual and scholarly expectations of the University, to the skills needed for advanced study and lifelong learning, and to the student development opportunities with academic merit. In addition, this office provides a series of communications designed to introduce the University, to inform students of the required procedures for matriculation, and to offer a perspective on college life. These communications also give new students practical information about important dates, times, and locations (e.g., arrival day, first day of classes, course drop/add, etc.).

Many programs for new students are scheduled during arrival week each semester. During this period, new students receive instruction and counseling concerning their courses of study and participate in extracurricular and cultural activities. Registration is also held during arrival week.

BASIC SKILLS

The Basic Skills Program consists of both academic services and courses designed to accommodate differences between high school preparation and the minimum college-level skills necessary for success in introductory University courses. The primary goal of this program is to provide academic support in writing, reading, mathematics, and other essential learning processes. Students may be identified for basic skills assistance via FTCAP placement scores or referral (self-, instructor, adviser, etc.).

Students with weaknesses in English composition are required to enroll in English 004 (3 credits) prior to scheduling English 015. English 004 provides intensive practice in expository writing with instruction in the basic conventions of syntax and mechanics. A 1-credit tutorial, English 005, may be taken concurrently with English 004. Credits earned in English 004 and 005 do not substitute for minimum program requirements designated under the categories of "General Education," "Requirements for the Major," or "Electives."

Students with mathematics weaknesses are encouraged to strengthen these skills by reviewing the following topics: operations with rational numbers and decimals; applications involving ratio, proportion, and percent; factoring algebraic expressions; operations with polynomials; properties of exponents; solutions of linear equations and inequalities; operations with radical expressions; solution of quadratic equations and inequalities; graphing in the coordinate plane; and solutions of systems of equations. Credited courses are available to assist in the review of the topics. The credits earned in these courses may not be used for minimum program requirements for "General Education," "Requirements for the Major," or "Electives."

Assistance in reading is available through a series of college reading improvements courses. RCLED 005 focuses on the development of basic reading skills and their efficient application to college study. RCLED 010 involves incorporation of higher-level vocabulary, comprehension, and study skills in content area courses. Each course is offered for 3 credits and may be used to fulfill elective credits if program requirements in this category are not restricted by program, department, or college policy.

The Learning Center, a resource available at most campus locations, offers a variety of services. This facility and its resources are open to any student who needs or wants assistance in the basic skill areas of writing, reading, and mathematics. Other Learning Center services may include study skills development, subject area tutoring, supplemental instruction, and computer-assisted learning.

DIVISION OF UNDERGRADUATE STUDIES (DUS)

The Division of Undergraduate Studies is an academic unit of the University that offers at the Commonwealth Campuses; Penn State Erie, The Behrend College; and University Park the following programs and services:

Freshman Testing, Counseling, and Advising Program—New freshmen admitted to the University are provided with comprehensive testing, educational planning, and academic advising prior to attending first-semester classes. The purpose of the program is to provide all new students with assistance in evaluating their educational plans and objectives.

Enrollment Program—New freshmen who prefer to test their abilities and interests or who want to explore several areas of study before identifying themselves with one of the University's colleges may request to begin their enrollment in the Division of Undergraduate Studies. Other students who are enrolled in the University but who experience changes in interests or educational objectives, who discover new program opportunities, or who want to gain a better perspective of their abilities may also seek enrollment in the division to facilitate a change to a new program of study.

Academic Advising Program—All students, whether or not they are enrolled in the Division of Undergraduate Studies, have available to them the professional advising, educational planning, and referral services provided by DUS. Such services are a supplement to and are coordinated with the advisory services of the colleges and other degree-granting units and faculty. Provisional students aspiring to degree programs are also served by this unit.

Academic Information Program—The Division of Undergraduate Studies provides a comprehensive academic information support system throughout the University to assist faculty in their student advisory responsibilities. Academic advising and information centers are located at each of the campuses in the Commonwealth Educational System and in the colleges and other degree-granting units of the University.

GRADING SYSTEM—The grades of A, B, C, D, and F indicate the following qualities of academic performance:

- A (EXCELLENT) Indicates exceptional achievement.
- B (GOOD) Indicates extensive achievement.
- C (SATISFACTORY) Indicates acceptable achievement.
- D (POOR) Indicates only minimal achievement. It indicates that the student may be seriously handicapped in carrying a more advanced course for which this course is a specific prerequisite.
- F (FAILURE) Indicates inadequate achievement necessitating a repetition of the course in order to secure credit.

The grades of A, A-, B+, B, B-, C+, C, D, and F indicate a gradation in quality from Excellent to Failure and are assigned the following grade-point equivalents:

| <i>Grade</i> | <i>Grade-Point Equivalent</i> |
|--------------|-------------------------------|
| A | 4.00 |
| A- | 3.67 |
| B+ | 3.33 |
| B | 3.00 |
| B- | 2.67 |
| C+ | 2.33 |
| C | 2.00 |
| D | 1.00 |
| F | 0 |

Grade points are determined by multiplying the grade-point equivalent of the grade earned by the number of credits for the subject; e.g., ENGL 015, 3 credits, with a grade of A (grade-point equivalent 4.00) yields 12 grade points.

GRADUATION REQUIREMENTS—In order to graduate, a student must complete the course requirements of the major and earn at least a C average (a grade-point average of 2.00) for all courses.

GENERAL INFORMATION

DEGREES—The associate degree majors outlined in this bulletin lead to the following degrees: Associate in Arts, Associate in Engineering Technology, and Associate in Science.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT THE UNIVERSITY PARK CAMPUS—Credits received for associate degree program courses may be applicable to a particular baccalaureate degree program listed in the current *Penn State Baccalaureate Degree Programs Bulletin* at the discretion of the appropriate college and major department.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT PENN STATE HARRISBURG—In addition to receiving an education to prepare for employment, the graduate of an associate degree program may also qualify for admission to various programs leading to a baccalaureate degree from Penn State Harrisburg. Those anticipating admission to Penn State Harrisburg should inquire at that college's Admissions Office late in their freshman year or early in their sophomore year concerning baccalaureate degree course requirements.

Graduates from associate degree programs in Business Administration or Computer Science may want to consider further study at Penn State Harrisburg in a Business Administration baccalaureate degree program.

Graduates of the associate degree majors in Architectural Engineering Technology, Biomedical Equipment Technology, Building Energy Systems Technology, Chemical Engineering Technology, Electrical Engineering Technology, Materials Engineering Technology, Mechanical Engineering Technology, Mining Technology, Nuclear Engineering Technology, Railway Engineering Technology, Surveying Technology, and Telecommunications Technology may want to consider continuing at Penn State Harrisburg in an engineering technology major leading to a bachelor of science degree in engineering technology. Majors are offered in Electrical Engineering Technology, Energy Technology, Environmental Engineering Technology, Mechanical Engineering Technology, and Structural Design and Construction Engineering Technology.

Associate degrees in the following majors are also acceptable toward admission to baccalaureate degree majors at Penn State Harrisburg: Forest Technology; Hotel, Restaurant, and Institutional Management; Labor Studies; Letters, Arts, and Sciences; Medical Laboratory Technology; Microcomputer Engineering Technology; and Sociology. Penn State Harrisburg programs related to these majors are offered by the college's Division of Humanities, Division of Behavioral Science and Education, and Division of Public Affairs.

Graduates of the associate degree majors in Science and in Computer Science may want to consider admission to the baccalaureate degree major in Mathematical Sciences at Penn State Harrisburg.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT PENN STATE ERIE, THE BEHREND COLLEGE—Graduates of associate degree majors may also qualify for admission to a variety of baccalaureate degree majors at Penn State-Behrend. Students interested in applying to Penn State-Behrend should contact that college's Admissions Office or talk with the Penn State-Behrend college representative at their campus.

Graduates of associate degree majors in either Business Administration or Computer Science may want to continue study in one of the following baccalaureate degree majors at Penn State-Behrend: Accounting, Business Economics, Management, or Management Information Systems. Students graduating with a two-year degree in Letters, Arts, and Sciences may want to consider any of a large number of majors offered by Penn State-Behrend in the liberal arts, sciences, and business.

Graduates of associate degree majors in Biomedical Equipment Technology, Electrical Engineering Technology, Microcomputer Engineering Technology, and Telecommunications Technology may want to continue their education in the baccalaureate degree major in Electrical Engineering Technology. Students receiving an Associate in Engineering Technology degree in Mechanical or Architectural Engineering Technology or Building Energy Systems Technology may want to continue study in a baccalaureate degree major in either Mechanical or Plastics Engineering Technology.

EXTENDED BACCALAUREATE DEGREE PROGRAMS—Graduates of associate degree majors also may qualify for admission to one of the extended baccalaureate degree programs offered at the following Penn State campuses: B.A. or B.S. in Administration of Justice at Fayette Campus; B.S. in Electrical Engineering Technology at Berks, New Kensington, and Wilkes-Barre Campuses; B.A. in General Arts and Sciences at Altoona, Beaver, Delaware County, DuBois, Fayette, McKeesport, New Kensington, Ogontz, Schuylkill, and Shenango Campuses; and B.S. in Nursing at Allentown, Beaver, Berks, Delaware County, Fayette, McKeesport, New Kensington, Ogontz, Schuylkill, and Shenango Campuses and at Hershey. For more information, contact the Admissions Office at the campus offering the program.

STUDENT WELFARE

STUDENT GOVERNMENT—Representative student leadership is provided on each campus of the University by a student government association that functions through officers and representatives elected from and by the student body. In addition to their involvement in student programs at their local campuses, student officers and delegates from University campuses convene several times annually. These meetings provide for an exchange of information among the various student government associations and for systemwide coordination in student government and student activities.

STUDENT CONDUCT—The Code of Conduct prohibits acts that interfere with the basic purposes or processes of the University, or with the rights, health, and safety of its members. Such acts include, but are not limited to, academic dishonesty, unethical and destructive behavior, and violation of rules and regulations. Violations of the code are subject to disciplinary action that may include separation from the University. Students, faculty, or staff may file complaints regarding student violations of the Code of Conduct with the Office of Conduct Standards at any University location.

INSURANCE PROTECTION WHILE ATTENDING THE UNIVERSITY—Any student who wants insurance protection while in attendance at the University (1) against personal injury or liability, and/or (2) against loss of property by fire or theft must arrange personally for whatever insurance is desired.

HEALTH SERVICES—The University Health Service assists in promoting and maintaining the health of students.

Prior to their initial registration, all new full-time students entering the University must submit a medical history on a special form provided by the University. The completed form constitutes a vital part of the student's medical record.

The health services of the University are made available to students in accordance with a statement provided by each campus, pertinent to that campus, and published in its student handbook.

The University does not obligate itself for payment of medical services other than those provided by personnel employed or retained by the University and in facilities owned or contracted for by the University. Treatment provided in contract facilities must be authorized by the campus executive officer, the director of student programs and services, or the nurse.

Students are urged to protect themselves against medical expenses that may result from injury or illness by arranging for personal insurance coverage. An accident and sickness plan is available to all undergraduate students at a reasonable charge through the University Health Service, Student Insurance Office, (814) 865-7467.

DISABLED STUDENT SERVICES—Penn State encourages academically qualified disabled students to take advantage of its educational programs. It is the policy of the University not to discriminate against persons with disabilities in its admission policies or procedures or its educational programs, services, and activities.

GENERAL INFORMATION

The University is responsible for making all of its programs and services available to all its students. In cases where it is necessary to provide auxiliary services and programs to meet the specific needs of disabled students, it is the responsibility of the coordinator of the Office for Disability Services to make reasonable accommodations. Examples of such accommodations available to those with special needs are sign language interpreters, accessible University transportation, and classroom and library assistance. Students anticipating the need for special services, both before and after enrollment, are encouraged to contact the coordinator of the Office for Disability Services at University Park (105 Boucke Building) or the director of student programs and services at other campuses.

CAREER DEVELOPMENT AND PLACEMENT SERVICES—Career Development and Placement Services assists students in continual evaluation of their educational and career plans as they progress through college and helps them identify sources of personal or academic difficulty that may interfere with their progress. Individual as well as group educational and career counseling programs are available to students. A computerized guidance system, DISCOVER, is available for student use at each campus location.

A Student Programs and Services staff member at each campus is responsible for providing placement assistance for associate degree graduates. Services include inviting employers to the campus to interview graduates for permanent employment, providing job information, and assisting students in preparing for the job search process. Career Development and Placement Services at the University Park Campus supplies prospective employers (national, state, and local) with information concerning the associate degree programs and works cooperatively with the Commonwealth Campuses in assisting graduates to locate suitable employment.

STUDENT AID

In addition to the student aid information provided below, students may want to consult the admissions booklets sent to all applicants and the “Penn State Student Aid” brochure, available upon request. Additional questions should be directed to the Office of Student Aid, 314 Shields Building, on the University Park Campus, or to the student aid representative at other Penn State campuses.

AID PROGRAMS AVAILABLE TO ASSOCIATE DEGREE CANDIDATES

GRANTS (aid sources not requiring repayment)

Pell Grant—The Pell Grant is the major federal grant program available to undergraduates. This award is available to undergraduates pursuing their first baccalaureate or associate degree on at least a half-time basis (6 credits per semester).

Pennsylvania Higher Education Assistance Agency Grant (PHEAA)—This is a grant established by the Commonwealth to assist undergraduates who have a financial need as defined by PHEAA guidelines. Applicants must be residents of Pennsylvania and enrolled full-time.

Note: Non-Pennsylvania students should contact their state higher education assistance agencies for information on state grants available while attending Penn State. Names and addresses of higher education assistance agencies are available from the Office of Student Aid at University Park Campus or the student aid representative at other Penn State campuses.

Supplemental Educational Opportunity Grant (SEOG)—This grant is available to undergraduates with documented high financial need. It is normally awarded in combination with the College Work-Study Program and/or the Perkins Loan. Priority is given to students who appear to be eligible for the Pell Grant.

Penn State Academic Grant—This grant is awarded to students demonstrating academic excellence and high financial need.

LOANS

Stafford Loan Program (formerly GSL)—The Stafford Loan is a federally subsidized loan program, available through banks, savings and loan associations, and other private lenders, which offers students attending on at least a half-time basis the opportunity to borrow money for their education. An undergraduate may borrow up to \$2,625 per year with a maximum of \$17,250 for undergraduate studies.

PLUS/SLS Loan—Parent Loan for Undergraduate Students is an educational loan available to parents of dependent undergraduate students. Supplemental Loans for Students (SLS) is a loan available to independent undergraduate and graduate students. Similar to the Stafford Loan program, funds are provided by private lenders such as hometown banks, etc. The interest rate is 11.49 percent and the maximum dollar amount that can be borrowed per grade level is \$4,000. Repayment of the loan begins within sixty days after disbursement of loan. Student borrowers may defer payment of principal until six months after termination of studies.

PHEAA Alternative Loan—This is a privately insured loan created by PHEAA and designed to assist students and families in meeting educational costs not covered by other aid sources. Students applying for this loan must have a credit-worthy co-applicant with an annual income of at least \$25,000. The maximum loan amount per year is \$10,000, with a current annual interest rate of 9.5 percent. Monthly principal and interest payments begin sixty days after disbursement of the loan. Applications may be obtained from participating lenders.

Perkins Loan—This program provides loans of up to \$1,000 per year with an overall maximum of \$9,000 for undergraduate students with documented financial need. Nine months after termination of the student's enrollment, repayment starts at a simple interest rate of 5 percent per year. Postponement of repayment and loan cancellation may be arranged for certain types of employment following graduation.

University Loans—University loans are funds established by donors to help students who have a documented financial need. These loans help needy students meet the educational and living expenses required to attain a college degree. Repayment, at a simple interest rate of 6 percent per year, starts six months after termination of studies.

Note: First-time Penn State borrowers of the Stafford Loan or nonsubsidized Stafford and SLS Loans must participate in "Entrance Counseling" concerning loan obligations before any loan disbursement can occur.

EMPLOYMENT

College Work-Study Program (CWSP)—The CWSP is a form of federal aid that allows a student to earn a portion of the documented financial need through approved CWSP jobs. This is a nonrepayable source of aid because the student is paid an hourly wage for his or her employment.

Student Employment—Students who are interested in part-time employment on campus or in their local areas should contact their campus Student Employment Office.

SCHOLARSHIPS

University Scholarships—University scholarships are awarded on the basis of superior high school or college academic performance and, in most cases, documented financial need. They are awarded either by the scholarship committees in the various Penn State academic colleges, by the Freshman or Faculty Senate Scholarship Committee, or by the Commonwealth Campus Scholarship Committees.

GENERAL INFORMATION

HOW TO APPLY

All students applying for student aid should file the appropriate need analysis document. Pennsylvania residents should file the *Pennsylvania State Grant and Federal Student Aid Application* and non-Pennsylvania residents should file the *Financial Aid Form (FAF)*. Applications are available from high school guidance counselors, the Office of Student Aid, 314 Shields Building, The Pennsylvania State University, University Park, PA 16802, or from the student aid representative at other Penn State campuses. The recommended filing date is as soon after January 1 as possible but before February 15.

The need analysis document allows students to be considered for the following aid sources: Pell Grant, PHEAA State Grant (Pennsylvania residents only), SEOG, Perkins Loan, CWSP, Penn State Academic Grant, Penn State Scholarships, Stafford Loan, PLUS/SLS Loans, PHEAA Alternative Loan, and University Loans.

A second application is needed in order to apply for the following aid sources: Penn State Scholarships (upperclass students only, freshmen are automatically considered), the Stafford Loan, PLUS/SLS Loans, and PHEAA Alternative Loan. Students should allow six to eight weeks for the processing of these loans.

Note: A Financial Aid Transcript must be submitted from all institutions previously attended whether or not aid was received. Please request your prior institution(s) to send your financial aid transcript(s) to the Office of Student Aid. All students are urged to explore, on their own, scholarship/grant opportunities as well as any private, low-interest loan funds offered by employers and civic organizations.

HOW MUCH DOES IT COST TO ATTEND PENN STATE?

One of the major concerns of students and their parents is knowing how much it will cost to attend Penn State for an academic year. The following itemized list of expenses, although prepared for the 1990–91 academic year, may be used as a basic guide for planning. Students may find that some of the costs vary according to individual needs and circumstances.

STUDENT BUDGET—1990–91

| | <i>Residence Halls or Off-Campus Housing</i> | <i>Living at Home</i> |
|---|--|-------------------------------|
| Tuition and Fees | \$4,048* | \$4,048* |
| Room & Board | 3,510 | 1,500 |
| Books & Supplies | 406 | 406 |
| Clothing & Laundry, Transportation, Personal Maintenance, Medical, & Recreation | 2,124 | 2,618 |
| Total* | \$10,088 | \$8,572 |

*For non-Pennsylvania residents, the nonresident undergraduate tuition and fees figure of \$8,444 should be substituted. The total estimated budget for a non-Pennsylvania undergraduate student at any campus location is \$14,484.

For Pennsylvania residents, 1990–91 undergraduate tuition and fees at the Commonwealth Campuses is \$3,922.

STUDENT AID POLICIES

The Office of Student Aid at Penn State administers and coordinates the aid programs according to applicable federal and state regulations and University policies that guarantee each student equal access to financial assistance. The Office of Student Aid employs the standard need analysis services of the College Scholarship Service and the Pennsylvania Higher Education Assistance Agency

to assess the aid eligibility of student applicants, ensuring equity of treatment among all applicants.

Eligibility for aid is contingent upon the student's financial need for assistance to meet educational costs. Each program has specific eligibility requirements that must be met before funds are awarded. In addition to financial need as a criterion for receiving aid, a student must be enrolled as a degree or provisional student. Nondegree students are not eligible to receive aid at Penn State. The University may require an official copy of the Federal Income Tax Form 1040 to verify eligibility for aid.

The Office of Student Aid assumes that all aid applicants will keep apprised of all application deadlines pertaining to the aid sources they are seeking. Because limited funds are available, applications filed after the applicable deadline dates are considered only as funds permit. On-time applicants receive first consideration. Some aid programs have flexible application deadlines that permit students to receive consideration at most times during the year (for example, the Stafford Loan and Pell Grant programs). Current and prospective aid recipients are strongly encouraged to keep well informed of aid application procedures through aid publications, news media, and agencies providing aid information such as the Office of Student Aid at University Park and the student aid representative at other Penn State campuses.

Aid is never automatically awarded for subsequent years. Students must reapply each year for funds. Students who plan to attend during summer session must file former-year as well as current-year applications to be considered for all aid programs. The Pell Grant program has no separate summer application and is generally awarded to students during the fall/spring academic year. Pell Grant recipients not attending the entire fall/spring year should contact the Office of Student Aid to determine if a summer payment is possible.

One of the goals of the Office of Student Aid is to help student aid recipients receive a student aid package that will attempt to meet the student's documented financial need. The student aid package can be composed of federal aid, state grant monies, private award sources, or any other source of funds available to the student.

It is the responsibility of the Office of Student Aid, however, to assure the federal government that federal aid recipients will not be permitted to retain financial aid *exceeding* their need. Students should be aware that if the aid received is in excess of need, they will be notified of their responsibility to return the excess amount to the University.

FEDERAL STUDENT ASSISTANCE SATISFACTORY ACADEMIC PROGRESS STANDARD

Satisfactory academic progress must be maintained for continued consideration for federal financial assistance at Penn State. Students must comply with the following to ensure continued consideration:

1. Academic progress is determined during an annual review each spring. The review determines student aid eligibility for the next enrollment period (summer session and/or the following academic year).
2. Undergraduate students registering full-time must complete a minimum of 26 credits (based on full-time enrollment) in their first year to maintain satisfactory academic progress. Upperclassmen can maintain satisfactory academic progress by continuing to successfully complete the minimum credits required.
3. The minimum credit requirement is determined in proportion to the number of credits registered. For example, three-quarter-time students will be required to progress at 3/4 the minimum standard.
4. Students who drop credits, withdraw from a semester, unsuccessfully complete credits, enroll in audit or repeat courses, etc., may fall below the minimum requirement for satisfactory progress.
5. A probation period is granted to undergraduate students who fall below the minimum credit requirement, but within the probation standard. Students on probation remain eligible for aid. The probation period lasts one academic year, after which the minimum credit requirement must be satisfied for future student aid eligibility.
6. Undergraduate students who are more than 10 credits deficient of the minimum credit requirement are determined to be making unsatisfactory progress and are not eligible for student aid.

GENERAL INFORMATION

- 7. Students falling to unsatisfactory progress, but returning to satisfactory progress through completion of summer session or fall semester credits, may be considered for student aid during the remainder of the academic year, on a funds-available basis.
- 8. Requirements for the associate degree must be completed within six semesters.

Exceptions to the above and information concerning reinstatement of aid can be obtained by contacting the Office of Student Aid, The Pennsylvania State University, 314 Shields Building, University Park, PA 16802. Copies of the Federal Student Assistance Satisfactory Academic Progress Standard are available from the Office of Student Aid at University Park or the Office of Student Programs and Services at other Penn State campuses.

SELECTIVE SERVICE REGISTRATION COMPLIANCE

Educational institutions are now required by law to collect a Statement of Registration Compliance from every federal student aid recipient whether male or female. This attests to their status with the Selective Service. Disbursement of federal student aid funds cannot occur until the Statement of Registration Compliance is on file with the Office of Student Aid. This requirement applies to Perkins Loan (NDSL), SEOG, CWSP, Pell, Stafford Loan (GSL), and PLUS/SLS programs.

DEFAULT STATEMENT

Educational institutions also are required by law to collect a Default Statement from every federal student aid recipient. This certifies that the student is not in default on any loan made under the Stafford Loan (GSL), PLUS/SLS, Consolidation, Income Contingent, or Perkins Loan (NDSL) programs and that he/she does not owe a refund on a grant received under the Pell Grant, SEOG, SSIG, or Byrd Scholarship programs. Disbursement of federal aid funds cannot occur until the Default Statement is on file with the Office of Student Aid. This requirement applies to the Perkins Loan (NDSL), SEOG, CWSP, Pell, Stafford Loan (GSL), and PLUS/SLS programs.

ESTIMATED TUITION, ROOM, BOARD, AND OTHER CHARGES

Note: The University reserves the right to revise tuition, room, board, and other charges without further notice. Tuition and charges for baccalaureate and graduate programs are listed separately in the *Baccalaureate Degree Programs*, *Graduate Degree Programs*, and *Penn State Harrisburg Bulletins*. Penn State has two semesters and a summer session. Students normally attend two semesters per year. The tuition and charges set forth below are for the 1990–91 academic year. The actual tuition and charges for the 1991–92 academic year will be established prior to the beginning of the fall semester of the academic year.

TUITION—Tuition per semester for associate degree students in 1990–91:

| | | |
|--|-----------------------|---------------------------|
| 12 or more credits: | <i>Pennsylvanians</i> | <i>Non-Pennsylvanians</i> |
| University Park Campus, Penn State-Erie, | | |
| Penn State Harrisburg | \$1,989 | \$4,187 |
| Commonwealth Campuses | 1,926 | 4,187 |
| 11 or fewer credits: | <i>Pennsylvanians</i> | <i>Non-Pennsylvanians</i> |
| University Park Campus, Penn State-Erie, | | |
| Penn State Harrisburg—rate per credit | 165 | 350 |
| Commonwealth Campuses—rate per credit | 154 | 330 |

Enrollment Charge—All entering students who plan to enroll for 12 or more credits are required to pay a nonrefundable enrollment charge of \$75 upon acceptance of an offer of admission.

General Deposit—Undergraduate students are required to make a general deposit of \$50 at the time of admission. This deposit will serve to safeguard the property and equipment used by students in their course of study. It will be retained until a student withdraws or is graduated.

The deposit, less any charges for equipment damages, losses, and forfeitures, will be refunded early in the subsequent semester to the student who has withdrawn or been graduated. The refund will be made by check and mailed to the student's home address.

Credit by Examination—A charge of \$30 per credit is made for credit by examination. For evaluation of credits completed elsewhere, a charge of \$35 is made for those applying for admission and a charge of \$3 for those who are already matriculated.

Student Activities—Student activities charges are determined by elected representatives of the student body, together with a faculty representative.

Certification and Verification Fee—A charge of \$4 is made for each request for verification or certification of enrollment.

Change of Schedule Charge—Unless a change is necessitated by the University, a charge of \$6 per day is made for each change of schedule after the first five working days of a semester.

Late Registration Charge—Unless the delay is unavoidable, \$10 is charged a student who fails to register on the appointed day.

Other Expenses—Books and supplies must be secured by the student. These vary from approximately \$125 per semester, depending upon the program.

TERMS OF PAYMENT—Tuition and charges, including room and board, are due and payable in advance of each semester at the Office of the Bursar, The Pennsylvania State University, 103 Shields Building, University Park, PA 16802. Registration for courses is not complete until an estimated bill is processed.

Approximately six weeks in advance of each semester, the University will mail to each continuing and newly admitted degree student of record an estimated bill for tuition and, where applicable, residence hall charges. Payment by mail is encouraged before the established deadline. The receipt is returned to the student by mail. If checks tendered for payment of tuition and charges are not paid upon presentation to the maker's bank, the student will automatically incur the late payment fee of \$25, and the receipt previously mailed will be considered null and void.

Any student who does not fulfill payment of obligations by the deadline established may be charged the late payment fee of \$25. This charge for late payment also applies to unpaid student supplemental charges. Students whose accounts are delinquent for more than ten days are subject to suspension from the University.

The University reserves the right to withhold transcripts and services to any current or former student who has an unsatisfied financial obligation to the University.

TUITION ADJUSTMENT POLICY

WITHDRAWAL—Charges for tuition, room, and board are adjusted upon withdrawal from the University only in the event the student obtains an Official Withdrawal Form at the office of the dean of his or her college or other degree-granting unit and presents it at the Office of the Registrar. Adjustments of tuition are based upon the date of last class attended provided the Official Withdrawal Form is presented within one calendar month of that date, otherwise the adjustment will be based on the date the Official Withdrawal Form is presented at the appropriate office. Adjustments of room and board are based upon the date belongings are removed and the room key and meal ticket are returned, or the effective date of the withdrawal from classes, whichever is later. Students, both full-time and part-time, who meet these conditions are entitled to receive adjustments of tuition, room, and board in accordance with the following schedule:

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Adjustment of 80 percent upon withdrawal before the end of the first week of the semester (seventh consecutive calendar day from the first day of classes) and a decrease of 10 percent for each week thereafter up to and including the eighth consecutive calendar week. No adjustment for withdrawal will be made after the eighth consecutive calendar week of the semester.

ADJUSTMENT OF CHARGES FOR TUITION, COURSES FEWER THAN FIFTEEN WEEKS (SEMESTER)

| <i>Duration</i> | <i>Tuition-Adjustment Percentage</i> |
|------------------|---|
| 1 week or less | 0 |
| 2–3 weeks | first week 50; second week 0 |
| 4–5 weeks | first week 70; second week 40; third week 0 |
| 6 weeks | first week 70; second week 40; third week 20; fourth week 0 |
| 7–10 weeks | first week 80; second week 60; third week 40; fourth week 20; fifth week 0 |
| 11 weeks or more | 80 percent first week and a decrease of 10 percent for each week thereafter up to and including the eighth consecutive calendar week. |

POLICY FOR STUDENTS ENROLLED FOR 12 OR FEWER CREDITS—If a student is enrolled for 12 or fewer credits and drops 1 or more credits, adjustments will be determined on the effective date of the drop using the same adjustment percentage as listed above under withdrawal.

TERMS OF ADJUSTMENT—The University will not release refunds of tuition, room, and board until at least three weeks have elapsed from the date the payment was received. All refunds will be made by check and mailed to the student's home address. No refunds will be made for other charges.

Requests for refunds based on withdrawal from the University should be addressed to the Office of the Bursar, The Pennsylvania State University, 103 Shields Building, University Park, PA 16802.

Deposits or deposit balances and credit balances on student accounts will be refunded to the student early in the semester following the student's withdrawal or graduation. The refund will be made by check and mailed to the student's home address that is currently on file with the University. All financial obligations of every kind, whether matured or unmatured, due and owing to the University must be completely settled before any refund is issued.

If, due to incorrect student address information, the University's attempt to forward a refund fails, the University will retain the deposit and/or the student account credit balance for one year. After one year, the refund amount will become a general gift to the University.

RESIDENCE CLASSIFICATION

The policy for determination of a student's Pennsylvania resident status for tuition purposes is as follows:

A. *Pennsylvania Classification*—A student shall be classified as a Pennsylvania resident for tuition purposes if that student is in fact a bona fide resident of the Commonwealth. A student whose presence in the Commonwealth is primarily for *educational purposes* shall be presumed to be a non-Pennsylvania resident for tuition purposes. The following are considerations which may be used by the University in determining whether a student is a bona fide resident for tuition purposes:

1. A student under the age of 21 is presumed to have the residence of his/her parent(s) or legal guardian(s).
2. A student who has resided in the Commonwealth for other than educational purposes for at least a period of twelve (12) months immediately preceding his/her initial enrollment at Penn State is presumed to be a Pennsylvania resident for tuition purposes.

3. A student who has not resided continually in Pennsylvania for a period of twelve (12) months immediately preceding his/her initial enrollment at Penn State is presumed to be a non-Pennsylvania resident for tuition purposes.
4. A student requesting to be classified as a Pennsylvania resident for tuition purposes must be a citizen of the United States or must have indicated by formal action his/her intention to become a citizen or must have been admitted to the United States on an immigrant visa. A student admitted to the United States on a tourist or a student (non-immigrant) visa is not eligible for a classification as a Pennsylvania resident for tuition purposes.
5. A United States government employee or member of the armed forces who was a resident of Pennsylvania immediately preceding his/her entry into government service and who has continuously maintained Pennsylvania as his/her legal residence will be presumed to be a Pennsylvania resident.
6. A student receiving a scholarship, guaranteed loan, grant or other form of financial assistance dependent upon residence in a state other than Pennsylvania is not a Pennsylvania resident for tuition purposes.

B. *Reclassification of Residency*

A student requesting reclassification as a Pennsylvania resident for tuition purposes must demonstrate by clear and convincing evidence that his/her permanent residence is in Pennsylvania, and that his/her presence in Pennsylvania is not primarily for educational purposes. Each case shall be decided individually on the basis of all facts submitted by the petitioner. Accordingly, it is not possible to list a specific combination of factors or set of circumstances which if met would insure reclassification for tuition purposes. However, the following are factors which may be considered by the University in its determination of the petitioner's request for reclassification as a Pennsylvania resident for tuition purposes:

1. Purchase of a permanent residence within Pennsylvania. This must be the principal residence of the student and/or his/her parent(s) and legal guardian(s).
2. Payment of applicable state and local taxes, and the filing of appropriate returns for such taxes.
3. Financial self-support and emancipation: Students who claim financial self-support or emancipation should provide the following evidence to support their claims:
 - a. Complete financial disclosure with appropriate evidence to indicate sufficient income to provide minimum funds for tuition, living, and related expenses as determined by the University's Office of Student Aid.
 - b. Copy of latest Pennsylvania and Federal Personal Income Tax return.
 - c. Sworn statement from parent(s) or legal guardian(s) that the student will be claimed as a dependent on current or future Federal Income Tax returns.
4. Presentation of clear and convincing evidence that although the parent(s) or legal guardian(s) on whom the student is dependent resides or has moved outside the Commonwealth, the student has maintained continuous residence in the Commonwealth for other than educational purposes for a period of at least one year immediately prior to her/his initial enrollment at the University, and the student continues to maintain such separate residence.

The student may submit evidence of any other facts believed to be relevant to the reclassification request, such as evidence of full-time employment in Pennsylvania or registration to vote.

C. *Reclassification Procedure*

1. A student may challenge his/her residence classification by filing a written petition with the person or committee designated to consider such challenges at the University. Such person or committee shall consider such petition and render a timely decision which shall constitute an exhaustion of administrative remedies.
2. Any reclassification resulting from a student's challenge or appeal shall be effective at the beginning of the semester or session during which the challenge or appeal was filed or at the beginning of the following semester or session. The decision as to which semester or session becomes the effective date shall rest with the person or committee rendering the decision on reclassification.
3. A student who changes his/her place of residence from Pennsylvania to another state is required to give prompt written notice of this change to the University and shall be reclassified as a non-Pennsylvanian for tuition purposes effective with the date of such change.
4. A dependent resident student whose parent(s) or guardian(s) move outside of the Commonwealth may remain a Pennsylvania resident for tuition purposes if he/she continues to maintain a separate residence within the Commonwealth.

GENERAL INFORMATION

NONRESIDENT STUDENT CLASSIFICATION

- A. A student is initially classified as a nonresident based on information provided by the student when applying for admission to the University. The initial classification is made as follows:
 - 1. Undergraduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Academic Services Officer
 - b. All other locations—Undergraduate Admissions Office, The Pennsylvania State University, University Park, PA 16802.
 - 2. Graduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Academic Services Officer
 - b. All other locations—Dean of the Graduate School
 - 3. Medical Student
 - The Milton S. Hershey Medical Center—Office of Student Affairs, The Milton S. Hershey Medical Center
- B. A student may challenge his/her residency classification by filing a written petition as follows:
 - 1. Undergraduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Financial Officer
 - b. All other locations—Fee Assessor
 - 2. Graduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Financial Officer
 - b. All other locations—Fee Assessor
 - 3. Medical Student
 - The Milton S. Hershey Medical Center—Controller, The Milton S. Hershey Medical Center
- C. The appropriate University official reviews the student's petition and makes a residency decision.
- D. The student may appeal that officer's residency decision to the University Appeals Committee on Residence Classification having representation from the Assistant Controller's Office, Undergraduate Admissions Office, and Graduate School. The committee's decision on appeal shall be final.

MAJORS

GENERAL EDUCATION

The University Faculty Senate, at its meeting on April 30, 1985, adopted the following statement as a comprehensive definition of general education:

General Education is the breadth of knowledge involving the major intellectual and aesthetic achievements of humanity. This must include understanding and appreciation of the pluralistic nature of knowledge epitomized by the natural sciences, mathematics, social-behavioral sciences, humanities, and the arts. General Education aids students in developing intellectual curiosity, strengthened ability to think, and a deeper sense of aesthetic appreciation. General Education, in essence, aims to cultivate a knowledgeable, informed, literate human being.

An effective General Education program enables students to:

1. acquire knowledge through critical reading and listening;
2. analyze and evaluate, where appropriate in a quantitative manner, the acquired knowledge;
3. integrate knowledge from a variety of sources and fields;
4. make critical judgments in a logical and rational manner;
5. recognize and comprehend the role of physical activity in meeting the demands of daily living;
6. learn to communicate effectively;
7. comprehend the reality of international interdependence and cultural diversity;
8. comprehend the role of aesthetic and creative activities in meeting the demands of daily living.

Courses taken to meet General Education program requirements may not be taken under the Satisfactory-Unsatisfactory option.

The General Education program for Penn State associate degree students consists of 21 credits distributed among communication and quantification skills (6 credits), the distribution areas (12 credits), including breadth and depth courses in the natural sciences (3 credits), arts (3 credits), humanities (3 credits), and social and behavioral sciences (3 credits), and an additional 3 credits in any General Education area.

Opportunities for qualified students to substitute advanced courses for courses on the breadth and depth lists are indicated below.

A. Breadth Courses

Breadth courses introduce and integrate major areas of knowledge, presenting the most fundamental and universal concepts, issues, and achievements in the discipline or cluster of disciplines. They represent the offering unit's special effort to help a wide range of students obtain coherent overviews of major findings and modes of investigation. While each breadth course stimulates further interest in the discipline(s), it may be, for many students, the only course taken in the discipline(s). Each breadth course, therefore, develops for such students a substantial, nonspecialized appreciation for the primary ways in which the discipline or cluster of disciplines contributes to a useful understanding of the human condition and/or its environment.

1. *Natural sciences breadth courses* emphasize the order, diversity, and beauty of nature, the concepts in the disciplines most useful to an informed citizenry, and how scientific understanding can bear on the formulation of individual and social values. The courses promote understanding of the inductive and deductive reasoning processes and develop a student's ability to reason inductively and deductively.

Scientific and technical disciplines require more advanced courses in basic sciences as essential foundations for further study in a range of majors. Such courses, which assume an already developed sense of the "general" aspects of the field, may be substituted for natural sciences breadth courses in any major.

2. *Arts breadth courses* emphasize how the traditions, literature, and history of the arts and architecture express the cultural values of society. These courses introduce major figures,

ideas, and artistic achievements in coherent patterns across substantial chronological ranges. They examine the terminology, techniques, attitudes, ideas, and skills that the arts areas comprise, so students can understand the approaches to human existence that distinguish the arts.

3. *Humanities breadth courses* emphasize coherent overviews of cultural and intellectual currents shaping or interpreting individual and social values. In thematically coherent patterns, they relate major figures, ideas, achievements, and/or world-shaping events to the most enduring continuities in human experience. Breadth courses in history, literature, philosophy, religion, and interdisciplinary humanities explore these topics across substantial chronological ranges, consistently relating the past to the present.
4. *Social and behavioral science breadth courses* emphasize major concepts, findings, and analytic methods most useful to an informed citizenry that needs to understand politics, economic systems, social institutions, individual and group behavior, and human communication. Such courses emphasize how an understanding of the multiple nature of causality in social settings can bear on the formulation of individual and social values.

B. Depth Courses

Depth courses, while emphasizing the same concepts as the breadth courses, are narrower in scope. Depth courses provide opportunities to pursue selected major concepts, issues, and achievements in more detail than is possible in breadth courses. Depth courses also emphasize how a particular focus, whether on the past or present, is relevant to current individual, social, and/or scientific issues. The varying degrees of specialization in depth courses extend or deepen the perspectives, knowledge, and analytic skills emphasized in breadth courses.

Listed depth courses are generally numbered below the 200 level. A student who has developed general interests and competencies in any of the four distribution areas may, in consultation with an adviser and with the approval of the student's college dean, substitute 200- to 499-level courses for those on the list of depth courses.

COURSES TO BE USED FOR GENERAL EDUCATION

A. Skills (6 credits)

1. WRITING/SPEAKING (3 credits)

Courses designated with the suffix GWS satisfy this component.

2. QUANTIFICATION (3 credits)

Courses designated with the suffix GQ satisfy this component.

B. Distribution Component (12 credits)

Both breadth and depth courses satisfy this component. Students must take at least 3 credits of breadth or depth courses in each of the four areas of the distribution component.

1. *Breadth courses* are identified by the suffix G followed by a letter code corresponding to each of the distribution areas.

- a. Natural sciences breadth courses (GN)
- b. Arts breadth courses (GA)
- c. Humanities breadth courses (GH)
- d. Social and behavioral sciences breadth courses (GS)

2. *Depth courses* are identified by the suffix D followed by a letter code corresponding to each of the distribution areas, e.g., depth courses in the natural sciences carry the suffix DN. A student may, in consultation with the adviser and the approval of the student's college dean, substitute 200- to 499-level courses for those on the list of depth courses.

- a. Natural sciences depth courses (DN)
- b. Arts depth courses (DA)
- c. Humanities depth courses (DH)
- d. Social and behavioral sciences depth courses (DS)

C. An additional 3 credits in any General Education area

Students whose academic majors are in the areas of natural sciences, arts, humanities, and social and behavioral sciences may not meet the General Education program components by taking courses in the department or program *identical* to that of the academic major. All general education courses are to help students explore and integrate information beyond the specific focuses of their major.

RESERVATIONS—The University reserves the right to make such program or class changes as may become necessary because of insufficient enrollment or other contingencies. The University also reserves the right to make any necessary changes in tuition and charges without prior notice. Courses and programs described and listed in this bulletin are also subject to change without notice.

AGRICULTURAL BUSINESS (2 AGB)

PROFESSOR NEIL B. GINGRICH, *in charge*

The Agricultural Business major prepares students for employment in commercial agriculture and businesses serving agriculture. Three options allow students to specialize in either crop or livestock production or in agricultural business, which provides training in management, business organization, and sales.

The first two semesters are offered at selected Commonwealth campuses where students fulfill basic course requirements in accounting, business, English, and natural and social sciences. The second year at the University Park Campus provides course work in livestock and crop production, management, and agricultural business. As part of the requirements, there are supporting courses in agricultural engineering, farm management, agricultural marketing and sales. Each option allows the student a choice of electives to satisfy special interests and needs.

For the Associate in Science degree in Agricultural Business, a minimum of 68 credits is required.

| Scheduling Recommendation by Semester Standing | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits
(9–12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

| | | |
|------------------------|---|---|
| ELECTIVES: 0–6 credits | X | X |
|------------------------|---|---|

REQUIREMENTS FOR THE MAJOR: 53–59 credits
(This includes 9–12 credits of General Education courses; 6 credits of GWS courses; 3 credits of DN courses; 0–3 credits of DS courses)

REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 26 credits

| | | |
|--|---|---|
| PRESCRIBED COURSES (23 credits) | | |
| ACCTG 200(3), B LAW 243(3), BIOL 101 DN(4), 102 DN(4), CHEM 011(3), ENGL 015 GWS(3), SPCOM 100 GWS(3) | X | — |
| ADDITIONAL COURSES (3) | | |
| ENGL 202A GWS OR 202D GWS(3) | X | — |

REQUIREMENTS FOR THE OPTION: 27–33 credits

ANIMAL PRODUCTION OPTION: 33 credits

PRESCRIBED COURSES (18 credits)

| | | |
|---|---|---|
| AG E 214(3), AGRO 028(3), 200(3), AN SC 100(3), 202(3), PTYSC 201(1), 202(2) | — | X |
|---|---|---|

ADDITIONAL COURSES (6 credits)

| | | |
|------------------------------|---|---|
| AG EC 101 DS, 106, or 208(3) | — | X |
| AN SC 007 or 201(3) | — | X |

SUPPORTING COURSES AND RELATED AREAS (9 credits)

| | | |
|--|---|---|
| Select 6 credits in agricultural economics | — | X |
| Select 3 credits in agricultural engineering | — | X |

CROP PRODUCTION OPTION: 27 credits

PRESCRIBED COURSES (18 credits)

| | | |
|---|---|---|
| AG E 214(3), 322(3), AGRO 028(3), 200(3), AG EC 102(3), ENT 012(3) | — | X |
|---|---|---|

ADDITIONAL COURSE (3 credits)

| | | |
|------------------------------|---|---|
| AG EC 101 DS, 106, or 208(3) | — | X |
|------------------------------|---|---|

SUPPORTING COURSES AND RELATED AREAS (6 credits)

| | | |
|---|---|---|
| Select 3 credits in animal science or poultry science | — | X |
| Select 3 credits in horticulture | — | X |

GENERAL OPTION: 33 credits

PRESCRIBED COURSES (6 credits)

| | | |
|---------------------------|---|---|
| AG EC 297(3), AGRO 200(3) | — | X |
|---------------------------|---|---|

ADDITIONAL COURSES (15 credits)

| | | |
|---|---|---|
| AG EC 101 DS or 208(3); AG EC 102 or 232(3) | — | X |
| AG EC 106 or 200(3); AGRO 028 or PTYSC 200(3) | — | X |
| MGMT 100 or MKTG 220(3) | — | X |

SUPPORTING COURSES AND RELATED AREAS (12 credits)

| | | |
|---|---|---|
| Select 3 credits in agriculture or business | — | X |
| Select 3 credits in agricultural engineering | — | X |
| Select 6 credits in animal or poultry science | — | X |

**ARCHITECTURAL ENGINEERING
TECHNOLOGY (2 AET)**

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*

PROFESSOR DALE DROST, *Program Chair, Fayette Campus*

This major is designed to provide technically trained personnel between the level of high school graduate and professional architectural engineer or architect to support the architectural design and construction industries. Architectural engineering technicians work under the supervision of a graduate architect or architectural engineer. They translate sketches and design concepts into working drawings and specifications. To do so, they need basic skills in structural and environmental systems design and layout, familiarity with site planning, knowledge of building materials and equipment characteristics and performance, as well as the training in drafting techniques required for the realization of final drawings and specifications. The graduates of this major are prepared for employment in architectural, building engineering, or industrialized housing firms.

Graduates of the Architectural Engineering Technology major may qualify for admission to baccalaureate degree majors in Energy Technology, Mechanical Engineering Technology, or Structural Design and Construction Engineering Technology offered at Penn State Harrisburg. Or they may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Architectural Engineering Technology, a minimum of 72 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63–64 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses)

PRESCRIBED COURSES (58 credits)

| | | |
|---|---|---|
| AE T 101(3), 102(3), 103(3), 113(2), CMPSC 101 GQ(3), EG T 101(1), 102(1), ENGL 015 GWS(3), MATH 087 GQ(5), 088 GQ(5), MCH T 111(3), PHYS 150 DN(3) | X | — |
| AE T 204(3), 206(2), 207(3), 210(3), 214(3), 215(3), PHYS 151(3), SPCOM 100 GWS(3) | — | X |

ADDITIONAL COURSES (5–6 credits)

Select 5–6 credits from the following technical courses:

| | | |
|---|---|---|
| AE T 212, 297, BES T 101, 297, CE T 261, CHEM 011, CMPSC 102, EE T 100, EG T 103, 104, 201, 297, IE T 105, MATH 140 GQ, 141 GQ, 231, 250, MCH T 213, ME T 207, 281 | — | X |
|---|---|---|

BIOMEDICAL EQUIPMENT TECHNOLOGY (2 BET)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*

PROFESSOR RICHARD ASTON, *Program Chair, Wilkes-Barre Campus*

During the past several decades, the medical community has grown to depend increasingly on machines for the delivery of quality health care. Biomedical equipment technicians are men and women responsible for maintaining these machines in accurate and safe working order. Their tasks include functional and safety inspecting, preventive maintenance, calibration, troubleshooting, and repair of this equipment. In addition, they may be involved in equipment control programs, in electrical safety assurance programs, and in training hospital personnel in the safe and proper use of the equipment. The classroom and laboratory portions of this major focus on electronically based

patient monitoring equipment. The student is, however, exposed to a much broader spectrum of biomedical equipment through a ten-week practical internship in an approved health care facility.

Graduates of the Biomedical Equipment Technology major may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Harrisburg and at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Biomedical Equipment Technology, a minimum of 75 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

| <i>Scheduling Recommendation by Semester Standing</i> | | |
|---|-----|--------|
| 1-2 | 3-4 | Summer |

GENERAL EDUCATION: 21 credits
(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 66 credits
(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (63 credits)

| | | | |
|---|---|---|---|
| CMPSC 101 GQ (3), ENGL 015 GWS (3), MATH 087 GQ (5), 088 GQ (5) | X | — | — |
| EE T 101(3), 109 (1), 114(3), 117(3), 118(1), 120(1), EG T 101(1), 102(1), ENGR 002(1) | X | — | — |
| BIOL 041 DN(3), CHEM 011(3), PHYS 150 GN(3), SPCOM 100 GWS(3) | — | X | — |
| BE T 201(5), 202(5), 204(3), 205(3) | — | X | — |
| BE T 203 (4) | — | — | X |

ADDITIONAL COURSE (3 credits)

| | | | |
|--|---|---|---|
| Select 3 credits from the following technical courses: BE T 297, BIOL 029, CE T 261, CMPSC 102, EE T 211, 213, 297, EG T 203, I E 315, MCH T 211, or ME T 207 | — | X | — |
|--|---|---|---|

BUILDING ENERGY SYSTEMS TECHNOLOGY (2BEST)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*
PROFESSOR DAVID MEREDITH, *Program Chair, Fayette Campus*

This major prepares engineering technicians to work in all phases of the heating, ventilating, and air conditioning (HVAC) industry: from design to installation, from technical sales to testing, from customer service to system trouble-shooting. Graduates are employed by public utilities, by building contractors, by systems manufacturers, and by design firms. A few have started their own businesses. Some graduates prepare the detailed design drawings for new buildings, sizing components, and locating them in their structures. Others select and specify the equipment needed for safe and efficient operation of HVAC systems. Still others test existing systems and recommend improvements in energy management. Technical sales positions in these industries are also available. The program's emphasis on energy systems enables graduates to understand both conventional and state-of-the-art technology, including active and passive solar systems. Graduates are prepared for current and future positions in the industry.

For the Associate in Engineering Technology degree in Building Energy Systems Technology, a minimum of 71 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 62–63 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (57 credits)

| | | |
|--|---|---|
| AE T 101(3), 102(3), BES T 101(2), CMPSC 101 GQ(3), EG T 101(1), 102(1), ENGL 015 GWS(3), MATH 087 GQ(5), 088 GQ(5), ME T 281(4), PHYS 150 DN(3) | X | — |
| AE T 103(3), 204(3), BES T 204(3), 207(3), 208(3), 209(3), PHYS 151(3), SPCOM 100 GWS(3) | — | X |

ADDITIONAL COURSES (5–6 credits)

| | | |
|---|---|---|
| Select 5–6 credits from the following technical courses: AE T 207, 209, 210, 214, 215, 297, BES T 206, 297, CMPSC 102, CHEM 011, 012 DN, EG T 201, 297, MCH T 111, 212, 213, MATH 140 GQ, 141 GQ, 231, 250 | — | X |
|---|---|---|

BUSINESS ADMINISTRATION (2 B A)

PROFESSOR BENJAMIN HENSZEY, *in charge*

The two-year, college-level academic Business Administration major is designed to provide instruction in business administration that fulfills the requirements of various levels of responsibility higher than that held by high school graduates.

The primary objective of this major is to provide a managerially oriented program with sufficient communicative and mathematical skills, socially relevant course work, and advanced courses in specific business specialties to develop a well-rounded graduate.

Graduates of the Business Administration major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Business Administration, Humanities, or Public Policy offered at Penn State Harrisburg. Or they may qualify for admission to the baccalaureate degree majors in Accounting, Business Economics, General Business, Management, or Management Information Systems offered at Penn State Erie, The Behrend College.

For the Associate in Science degree in Business Administration, a minimum of 68 credits is required.

GENERAL EDUCATION: 21 credits

(6 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 53 credits

(This includes 6 credits of GWS General Education courses.)

| | Scheduling Recommendation by Semester Standing | |
|---|---|-----|
| | 1-2 | 3-4 |
| PRESCRIBED COURSES (33 credits) | | |
| Q B A 200 | X | — |
| ACCTG 200(3), 204(3), B LAW 243(3), ENGL 015 GWS(3), FIN 100(3), M I S 100(3), MGMT 100(3), MKTG 221(3), SPCOM 100 GWS(3) | X | X |
| ENGL 202D GWS(3) | — | X |
| ADDITIONAL COURSES (18 credits) | | |
| ECON 002 GS, 004 GS, or 014 GS(3)# | — | X |
| Select 15 credits from ACCTG 150, 160, 170, 206, B A 100, 195, B LOG 301, 304, 305, CMPSC 101 GQ, 102, 140, ECON 002 GS,* 004 GS,* FIN 108, H P A 101, 301, 310, INS 102, L,I R 100 DS, M I S 101, 103, 106, 110, 111, MGMT 150, MKTG 150, 160, 170, 180, 190, 220, OPMGT 150, PHIL 106, Q B A 201, R EST 100 | — | X |
| SUPPORTING COURSES AND RELATED AREAS (2 credits) | | |
| Select 2 credits in physical education | X | X |

COMPUTER SCIENCE (2CPSC)

PROFESSOR M. DEAN FENTON, *in charge*

The primary objective of the two-year Computer Science major is to prepare graduates for immediate and continuing employability as application programmers, associate systems designers, or associate systems programmers.

To meet this objective the major is designed to ensure a thorough knowledge of the techniques of programming general purpose digital computers, and includes extensive practice—using contemporary programming technologies—in the analysis, organization, validation, and documentation of effective computer code. The major also includes practical knowledge of the logical organization of modern digital computers and related peripheral equipment, the structure of operating systems and compilers, and considerations in the design of information systems.

The General Education component provides the student with an extension to the basic educational foundation. The general Requirements for the Major give the graduate technical competence in the computing and data processing field. The Application Specialization provides a practical knowledge of an area of application within which the graduate may profitably utilize the acquired computing talent.

For the Associate in Science degree in Computer Science, a minimum of 64 credits is required.

GENERAL EDUCATION: 21 credits

(9 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See the description of General Education at front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 52 credits

(This includes 9 credits of General Education courses: 3 credits of GQ courses; 6 credits of GWS courses.)

#Students going on to a four-year program should not take ECON 014 GS.

*Select one not taken above.

*Scheduling Recommendation
by Semester Standing*

| | | |
|--|-----|-----|
| | 1-2 | 3-4 |
|--|-----|-----|

PRESCRIBED COURSES (34 credits)

| | | |
|---|---|---|
| CMPSC 100(3), 101 GQ(3), 102(3), 140(3), ENGL 015 GWS(3), SPCOM 100 GWS(3) | X | X |
| CMPSC 142(3), 144(4), 154(3), 164(3), 174(2), 175(1) | — | X |

ADDITIONAL COURSES (6 credits)

| | | |
|--|---|---|
| ENGL 202C GWS OR 202D GWS(3) | X | X |
| Select 3 credits from MATH 005 GQ or above | X | X |

SUPPORTING COURSES AND RELATED AREAS (12 credits)

| | | |
|---|---|---|
| Select 9 credits of related courses in a technical specialization in consultation with adviser | X | X |
| Select 3 credits in Q B A, STAT, or MATH (above MATH 005 GQ) | X | X |

DIETETIC FOOD SYSTEMS MANAGEMENT (2EDSM)

PROFESSOR ELLEN P. BARBROW, *in charge*

The purpose of the Dietetic Food Systems Management major is to prepare food systems management dietetic technicians for middle management positions in the food service area of health care facilities or community feeding operations. Candidates for admission to this major must be employed at least fifteen hours a week in a health care facility food service operation where their work is supervised by a registered dietitian. Graduates become eligible for technician membership in the American Dietetic Association.

Students who meet admission criteria are admitted to the extended degree major in Dietetic Food Systems Management. The required courses are available primarily through correspondence study offered by the Department of Independent Learning.

Students who achieve outstanding records may, upon completion of this major, apply for admission to the Management Dietetics option of the baccalaureate degree major in Hotel, Restaurant, and Institutional Management in the College of Health and Human Development.

For the Associate in Science degree in Dietetic Food Systems Management, a minimum of 67 credits is required.

*Scheduling Recommendation
by Semester Standing*

| | | |
|--|-----|-----|
| | 1-2 | 3-4 |
|--|-----|-----|

GENERAL EDUCATION: 21 credits

(3 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

ELECTIVES: 3 credits**REQUIREMENTS FOR THE MAJOR: 46 credits**

(This includes 3 credits of GS courses of General Education courses.)

PRESCRIBED COURSES (37 credits)

| | | |
|--|---|---|
| D S M 100(1), 101(3), 103(3), 195(2), 205(3), 250(4), 260(4) | X | X |
| D S M 270(3), 295(4), 304(3), H P A 101(3), NUTR 252(4) | X | X |

| | <i>Scheduling Recommendation by Semester Standing</i> | |
|---|---|-----|
| | 1-2 | 3-4 |
| ADDITIONAL COURSES (6 credits) | | |
| NUTR 151 or 251 GHS(3) | X | X |
| SOC 001 GS or 003 GS(3) | X | X |
| SUPPORTING COURSES AND RELATED AREAS (6 credits) | | |
| Select 6 credits in consultation with the adviser to develop competence as a dietetic practitioner. | X | X |

ELECTRICAL ENGINEERING TECHNOLOGY (2 EET)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*
PROFESSOR EDWARD DREISBACH, *Program Chair, Wilkes-Barre Campus*

This major prepares graduates for technological service with manufacturers of electrical, electronic, and computer equipment; electrical utilities; and electrical maintenance and instrumentation departments of various industrial concerns. The principal objective is to provide a practical knowledge of electronic, digital, and microprocessor theory as well as electrical machinery and its applications.

Graduates of the Electrical Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology or in Energy Technology offered at Penn State Harrisburg. Or they may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Electrical Engineering Technology, a minimum of 72 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

| | <i>Scheduling Recommendation by Semester Standing</i> | |
|--|---|-----|
| | 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits
(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See General Education description in front of the *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63–64 credits
(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

| | | |
|---|---|---|
| PREScribed COURSES (62 credits) | | |
| CMPSC 101 GQ(3), EE T 101(3), 109(1), 114(3), 117(3), 118(1), 120(1), EG T 101(1), 102(1), ENGL 015 GWS(3), ENGR 002(1), MATH 087 GQ (5), 088 GQ(5) | X | — |
| EE T 204(2), 205(1), 206(1), 210(3), 211(4), 213(3), 215(3), 216(3), 219(1), 221(1), PHYS 150 DN(3), 151(3), SPCOM 100 GWS(3) | — | X |

| | | |
|--|---|---|
| ADDITIONAL COURSES (1–2 credits) | | |
| Select 1–2 credits from the following technical courses: | | |
| BI SC 003 GN, CHEM 011, 012 DN, CE T 261, CMPSC 102, EE T 297, EG T 103, 104, IE 315, IE T 105, MATH 140 GQ, 141 GQ, MCH T 110, or 111 | — | X |

FOREST TECHNOLOGY (2 FORT)

PROFESSOR KENNETH J. SWISHER, *in charge*

The objectives of the Forest Technology major are to train forestry field personnel in the technical aspects of evaluating, managing, and protecting forest resources. Practicums held on the Michaux State Forest, adjacent to the campus, stress field applications of classroom theory. Both written and oral communication skills are stressed in all courses. Graduates of the program are employed by businesses including federal and state timber management and recreation programs, urban tree service companies, pulp and paper manufacturers, surveying and landscaping firms, power companies and other businesses requiring personnel skilled in field data-gathering analysis and presentation.

Some graduates transfer their credits to bachelor degree programs such as business management, wildlife science, forest science, geology, parks and recreation, and environmental resource management.

For the Associate in Science degree in Forest Technology, a minimum of 66 credits is required.

*Scheduling Recommendation
by Semester Standing*

| | | |
|-----|--------|-----|
| 1-2 | Summer | 3-4 |
|-----|--------|-----|

GENERAL EDUCATION: 21 credits

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 45 credits

PRESCRIBED COURSES (39 credits)

| | | | |
|---|---|---|---|
| FOR 105(3), 137(1), 138(1), 140(2), 141(4), 240(3), 245(2), 250(3) | X | — | — |
| FOR 106(2), 108(1), 822(1) | — | X | — |
| FOR 220(3), 221(1), 242(3), 814(1), 860(1) | — | — | X |
| FOR 234(3), 241(4) | — | — | X |

ADDITIONAL COURSES (6 credits)

| | | | |
|--|---|---|---|
| Select 6 credits from ACCTG 200, FOR 817, WILDL 101, or 207 | — | — | X |
|--|---|---|---|

HOTEL, RESTAURANT, AND INSTITUTIONAL MANAGEMENT (2HRIM)

JAMES A. BARDI, *Director*

The Hotel, Restaurant, and Institutional Management major is an intensive four-semester major designed to prepare students for managerial positions in the hospitality industry. The course of study places heavy reliance on experience acquired in an on-the-job setting.

Students who achieve outstanding records may, upon completing this program, apply for admission to the baccalaureate degree major in Hotel, Restaurant, and Institutional Management in the College of Health and Human Development. Six or more additional semesters of satisfactory work are required to earn the baccalaureate degree. Graduates of this major may qualify for admission to other baccalaureate degree majors.

For the Associate in Science degree in Hotel, Restaurant, and Institutional Management, a minimum of 66 credits is required.

GENERAL EDUCATION: 21 credits

(See description of General Education in front of *Bulletin*.)

(3 of these 21 credits are included in REQUIREMENTS FOR THE MAJOR)

REQUIREMENTS FOR THE MAJOR: 48 credits

(This includes 3 credits of GWS courses.)

PRESCRIBED COURSES (40 credits)

| | | |
|---|---|---|
| ACCTG 200(3), ENGL 015 GWS (3), 202D GWS(3), HR&IM 201(2), 204(3), 250(4), 260(4), 270(4), 295(2), 310(3), 320(3), 337(3), 380(3) | X | X |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (8 credits)

| | | |
|---|---|---|
| Select 3 credits in nutrition | X | X |
| Select 5 credits in consultation with adviser to develop a competency in management or general business administration | X | X |

HUMAN DEVELOPMENT AND FAMILY STUDIES (2HDFS)

NANCY J. KURTZ, *Coordinator*

This major integrates practical and academic experiences to provide the student with entry-level professional competence in one of several human service fields. The objective of the major is to offer a general education background, a knowledge base in life-span and family development, and a core of professional skills that may be applied in program planning and service delivery activities. The major is offered as an extended degree, permitting part-time, evening, and independent learning course work credits to be earned.

ADULT DEVELOPMENT AND AGING OPTION: This option is designed to prepare students for a wide variety of service roles in nursing homes, area agencies on aging, senior citizen centers, and other sites for services to the elderly.

CHILD AND YOUTH SERVICES OPTION: This option is designed to prepare students for a variety of service roles in day and residential child and youth care systems, preschools, Head Start centers, and other child and youth service settings.

FAMILY SERVICES OPTION: This option is designed to prepare students for employment, under a variety of job titles, in the delivery of family services. Such services are offered across a wide range of settings: day care, Head Start, parent education, family planning, drug and alcohol programs, agencies for the disabled, child, youth, and family health and welfare agencies.

For the Associate in Science degree in Human Development and Family Studies, a minimum of 62 credits is required.

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

ELECTIVES: 2-4 credits

REQUIREMENTS FOR THE MAJOR: 49-51 credits

(This includes 12 credits of General Education courses; 6 credits of GWS courses; 3 credits of GS courses; 3 credits of DH courses.)

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 32-33 credits

*Scheduling Recommendation
by Semester Standing*

| | | |
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| | 1-2 | 3-4 |
|--|-----|-----|

PRESCRIBED COURSES (26–27 credits)

ENGL 015 GWS(3), HD FS 129 GS(3), PSY 002 GS(3),
 SPCOM 100 GWS(3)
 HD FS 216 DS(3)
 H DEV 395(8–9), HD FS 315(3)

| | | |
|--|---|---|
| | X | — |
| | X | X |
| | — | X |

ADDITIONAL COURSES (6 credits)

PHIL 103 DH or 104 DH(3)
 EDPSY 014 or HD FS 200(3)

| | | |
|--|---|---|
| | X | — |
| | X | — |

REQUIREMENTS FOR THE OPTION: 17–18 credits**ADULT DEVELOPMENT AND AGING OPTION: 17–18 credits****PRESCRIBED COURSES (6 credits)**

HD FS 249 DS(3), 311(3)

| | | |
|--|---|---|
| | X | X |
|--|---|---|

ADDITIONAL COURSES (2–3 credits)

Select 2–3 credits from H P A 101(3), HL ED 060 GHS(3),
 HD FS 218(3), 219(3), 297(1–3), NUTR 251 GHS(3),
 PSY 174(3), LE ST 120(3), 256(3), 277(3)

| | | |
|--|---|---|
| | X | X |
|--|---|---|

SUPPORTING COURSES AND RELATED AREAS (9 credits)

Select 9 credits in consultation with the adviser from
 University-wide offerings that enhance
 competence in the option.

| | | |
|--|---|---|
| | — | X |
|--|---|---|

CHILD AND YOUTH SERVICES OPTION: 17–18 credits**ADDITIONAL COURSES (8–9 credits)**

HD FS 229 DS or 239 DS(3)

| | | |
|--|---|---|
| | X | X |
|--|---|---|

Select 5–6 credits from HD FS 297(1–2), 330(1–4),
 HL ED 303 GHS(2), A ED 003 or 014(3),
 NUTR 251 GHS(3), PSY 213(3)

| | | |
|--|---|---|
| | X | X |
|--|---|---|

SUPPORTING COURSES AND RELATED AREAS (9 credits)

Select 9 credits in consultation with the adviser from
 University-wide offerings that enhance
 competence in the option.

| | | |
|--|---|---|
| | — | X |
|--|---|---|

FAMILY SERVICES OPTION: 17–18 credits**PRESCRIBED COURSES (6 credits)**

HD FS 219(3), 311(3)

| | | |
|--|---|---|
| | X | X |
|--|---|---|

ADDITIONAL COURSES (2–3 credits)

Select 2–3 credits from HD FS 218(3), 229 DS, 297(1–3)

| | | |
|--|---|---|
| | X | X |
|--|---|---|

SUPPORTING COURSES AND RELATED AREAS (9 credits)

Select 9 credits in consultation with the adviser from
 University-wide offerings that enhance
 competence in the option.

| | | |
|--|---|---|
| | — | X |
|--|---|---|

LETTERS, ARTS, AND SCIENCES (2 LAS)

PROFESSOR JEANETTE D. BRAGGER, *in charge*

The objectives of the Letters, Arts, and Sciences major are to broaden the student's understanding, interests, and skills; to help the student become a more responsible, productive member of the family and community; and to offer a degree program with sufficient electives to permit some specialization according to the student's interests or career plans. Letters, Arts, and Sciences is a complete two-year degree major. However, graduates who later seek admission to baccalaureate degree majors may apply baccalaureate credits toward the new degree. Any 800-level credits taken in the Letters, Arts, and Sciences program are not applicable toward most baccalaureate degrees.

In addition to a wide variety of baccalaureate majors offered at University Park, graduates of the Letters, Arts, and Sciences major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Elementary Education, Humanities, or Public Policy offered at Penn State Harrisburg. Or they may qualify for any of a large number of baccalaureate degree majors offered by Penn State Erie, The Behrend College, in business, the liberal arts, and sciences.

For the Associate in Arts degree in Letters, Arts, and Sciences, a minimum of 60 credits is required. ↗

| Scheduling Recommendation by Semester Standing | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits#

(6 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

ELECTIVES: 15 credits

REQUIREMENTS FOR THE MAJOR: 30 credits#

(This includes 6 credits of General Education GWS courses.)

PRESCRIBED COURSES (6 credits)

| | | |
|------------------|---|---|
| ENGL 015 GWS(3) | X | — |
| SPCOM 100 GWS(3) | — | X |

ADDITIONAL COURSE (3 credits)

| | | |
|------------------------------|---|---|
| ENGL 202A, B, C, or D GWS(3) | — | X |
|------------------------------|---|---|

SUPPORTING COURSES AND RELATED AREAS (21 credits)

| | | |
|--|---|---|
| Select 3 credits in any courses designated as arts* | X | X |
| Select 3 credits in any courses designated as humanities* | X | X |
| Select 3 credits in any courses designated as social and behavioral sciences* | X | X |
| Select 3 credits in any courses designated as physical, biological, or earth sciences* | X | X |

#The required credits of General Education and Requirements for the Major must be baccalaureate-level courses. For students intending to seek admission to a baccalaureate program upon graduation, it is recommended that most, if not all, of the courses be at the baccalaureate level. For those students who will seek a Bachelor of Arts degree upon graduation from Letters, Arts, and Sciences, it is strongly recommended that a foreign language be taken since admission to a Bachelor of Arts program in the College of the Liberal Arts requires one college-level course, or the equivalent, in a foreign language.

*Courses that will satisfy the arts, humanities, social and behavioral sciences, natural sciences, and quantification requirements are defined on the Letters, Arts, and Sciences checksheet, which may be obtained from the College of the Liberal Arts associate dean for undergraduate studies at the University Park Campus or from any Letters, Arts, and Sciences representative at the Commonwealth Campuses.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

Select 9 credits in any one of the following areas*: arts, humanities, social and behavioral sciences, natural sciences and quantification, and foreign language skills.

(If foreign language courses are chosen, it is recommended that these courses be in one foreign language sequence.)

X

X

MATERIALS ENGINEERING TECHNOLOGY (2MATE)

PROFESSOR W. MURRAY SMALL, *in charge*

The 1980s have seen several remarkable changes occurring within the materials industry. First, there has been the shifting profile among products of commerce, away from metals and toward ceramics and polymers. Second, there has been the increasing emphasis on the quality of products with the implementation of on-line instrumental checks for defects and statistical analysis. Third, there is a broad awareness about the importance of materials and manufacturing to a strong U.S. economy. Highly trained materials technicians have significant roles to play in this industry. Their training qualifies them to perform and supervise mechanical property and quality assurance tests on a variety of products. This program is designed to supply the student with extensive laboratory background to these key elements of materials technology. Courses are offered to give the student an exposure to the breadth of materials technology both from the basic side and frequent contact with industry.

For the Associate in Engineering Technology degree in Materials Engineering Technology, a minimum of 64 credits is required.

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 55 credits

(This includes 12 credits of General Education courses; 6 credits of GWS courses; 3 credits of DN courses; 3 credits of GQ courses.)

| | <i>Scheduling Recommendation by Semester Standing</i> | | |
|--|---|--------|-----|
| | 1-2 | Summer | 3-4 |
| PRESCRIBED COURSES (52 credits) | | | |
| CHEM 012 DN(3), 014 DN(1), CMPSC 101 GQ (3), EG T 101(1), 102(1), ENGL 015 GWS(3), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN(3), 151(3) | X | — | — |
| ENGL 202C GWS(3), IE T 109(3), MAT T 200(3), 201(3), 202(3), 203(3), 204(3), SPCOM 100 GWS(3) | — | X | — |
| ADDITIONAL COURSES (3 credits) | | | |
| IE T 112 or MAT T 295(3) | — | — | X |

*Courses that will satisfy the arts, humanities, social and behavioral sciences, natural sciences, and quantification requirements are defined on the Letters, Arts, and Sciences checksheet, which may be obtained from the College of the Liberal Arts associate dean for undergraduate studies at the University Park Campus or from any Letters, Arts, and Sciences representative at the Commonwealth Campuses.

MECHANICAL ENGINEERING TECHNOLOGY (2 MET)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*
PROFESSOR DAVID HUGGINS, *Program Chair, New Kensington Campus*

This major is intended to prepare detail or layout drafters and junior designers for manufacturing industries as well as for the many concerns engaged in installation or erection work. The principal objective is to prepare men and women for employment in machine design, tool and die design, or structural layout. Some graduates are involved in technical or industrial sales, become supervisors in light and heavy industry, or enter management trainee programs.

Graduates of this major may qualify for admission to the baccalaureate degree majors in Mechanical Engineering Technology, Structural Design and Construction Engineering Technology, or Energy Technology offered at Penn State Harrisburg. Or they may qualify for admission to the Mechanical Design and Materials option of the baccalaureate degree majors in either Mechanical or Plastics Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Mechanical Engineering Technology, a minimum of 72 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

| Scheduling Recommendation by Semester Standing | | | |
|---|--------|--|-----|
| 1-2 | Summer | | 3-4 |

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63-64 credits

(This includes 12 credits of General Education courses: 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (61 credits)

| | | | |
|--|---|---|---|
| CMPSC 101 GQ(3), ENGL 015 GWS(3), EG T 101(1), 102(1), 103(2), 104(1), IE T 101(3), 102(1), MATH 087 GQ(5), 088 GQ(5), MCH T 111(3), PHYS 150 DN(3) | X | — | — |
| IE T 112(3) | — | X | — |
| EE T 100(3), EG T 201(2), ENGL 202C GWS(3), IE T 215(3), MCH T 213(3), 214(1), ME T 206(3), 210(3), PHYS 151(3), SPCOM 100 GWS(3) | — | — | X |

ADDITIONAL COURSES (2-3 credits)

| | | | |
|---|---|---|---|
| Select 2-3 credits from the following technical courses: AE T 209, 297, CE T 111, 261, 297, EG T 297, IE T 105, 109, 297, ME T 207, 281, or 297 | — | — | X |
|---|---|---|---|

MEDICAL LABORATORY TECHNOLOGY (2 MLT)

PROFESSOR PHILIP W. MOHR, *in charge*

This two-calendar-year Medical Laboratory Technology major (four semesters, two summer sessions) is designed to provide the necessary general and technical training for hospital personnel between the level of the medical laboratory technician (certificate program) and the medical technologist (baccalaureate program). The course of study includes one year of intensive clinical experi-

ence at an affiliated hospital and the theoretical background necessary for the clinical procedures performed by the certified medical laboratory technician (associate degree program). Upon completion of program requirements, the student receives the associate degree and is eligible to sit for examinations leading to certification and registry as a medical laboratory technician.

Graduates of the Medical Laboratory Technology major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Humanities, or Public Policy offered at Penn State Harrisburg.

For the Associate in Science degree in Medical Laboratory Technology, a minimum of 69–71 credits is required.

*Scheduling Recommendation
by Semester Standing*

1-2 Summer* 3-4

GENERAL EDUCATION: 21 credits

(11–13 of the 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 60–63 credits

(This includes 11–13 credits of General Education courses; 6 credits of GWS courses; 3 credits of GN courses; 2–4 credits of GQ courses.)

PRESCRIBED COURSES (58–59 credits)

| | | | |
|--|---|---|---|
| BIOL 041 DN(3), 042(1), 101 DN(4), CHEM 012 DN(3–4), 014 DN(1), MICRB 201(3), 202 (2) | X | — | — |
| ENGL 015 GWS(3), MICRB 150(4), CHEM 034 (3) | X | X | — |
| SPCOM 100 GWSX | — | X | — |
| CMPSC 001 (1) | — | X | X |
| MICRB 151A(7), 151B(6), 151C(6), 151D(6), 151E(2) | — | — | X |

ADDITIONAL COURSES (2–4 credits)

| | | | |
|--|---|---|---|
| Select 2–4 credits from MATH 005 GQ(3), 006 GQ(3), 007 GQ(3), 017 GQ(3), 018 GQ(3), 110 GQ(4), 111 GQ(2), 140 GQ(4), STAT 200 GQ(4), or 250 GQ (3) | X | — | — |
|--|---|---|---|

MICROCOMPUTER ENGINEERING TECHNOLOGY (2MCMP)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*

PROFESSOR ARTHUR MARSICANO, *Program Chair, Schuylkill Campus*

This major is designed to prepare graduates for technical positions in the rapidly expanding field of microcomputers and their applications. A broad background in electrical and electronic principles is used as a foundation upon which to build the basic concepts of the microprocessor, to examine its internal functions, and to investigate its applications. Exposure to a variety of microprocessor/microcomputer systems and devices used with computers as well as hands-on experience in the operation, analysis, and construction of small computer systems provides graduates with a sound foundation for installing, diagnosing, and servicing microprocessor/microcomputer systems and the devices used with them.

Graduates of the Microcomputer Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology or in Energy Technology offered

*Scheduling of courses in Summer Sessions will depend on campus location.

MINING TECHNOLOGY

at Penn State Harrisburg. Or they may qualify for the baccalaureate Electrical Engineering Technology major offered at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Microcomputer Engineering Technology, a minimum of 73 credits is required.

| <i>Scheduling Recommendation by Semester Standing</i> | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 64–66 credits

(This includes 12 credits of General Education courses: 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

| | | |
|---|---|---|
| PRESCRIBED COURSES (60 credits) | | |
| EE T 101(3), 109(1), 114(3), 117(3), 118(1), 120(1), EG T 101(1), 102(1), ENGL 015 GWS(3), ENGR 002(1), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN(3) | X | — |
| CMPSC 101 GQ(3), EE T 205(1), 210(3), 211(4), MCMP 240(5), 241(4), 242(3), PHYS 151(3), SPCOM 100 GWS (3) | — | X |
| ADDITIONAL COURSES (1–3 credits) | | |
| Select 1–3 credits from the following technical courses: | | |
| BI SC 003 GN, CHEM 011, 012 DN, CE T 261, CMPSC 102, EE T 297, MCH T 213, MCMP 297, or ME T 207 | — | X |
| SUPPORTING COURSES AND RELATED AREAS (3 credits) | | |
| Select 3 credits in computer science | — | X |

MINING TECHNOLOGY (2MNGT)

PROFESSOR STANLEY C. SUBOLESKI, *in charge*

A student in the Mining Technology major covers a blend of basic sciences, mathematics, communications, arts, humanities, social sciences, and applied courses during the period of study. These courses are sequenced so that basic principles of physical processes are used to understand the specific procedures involved in mining. The curriculum covers a breadth of material at a level consistent with potential careers of mining technology graduates.

This major prepares students for either a management-oriented or an engineering-oriented position in the mining industry. Many graduates of this major, after serving the required apprenticeship, become certified managers in their fields.

Graduates of the Mining Technology major may qualify for admission to the baccalaureate degree majors in Energy Technology or in Structural Design and Construction Engineering Technology offered at Penn State Harrisburg.

For the Associate in Engineering Technology degree in Mining Technology, a minimum of 72 credits is required.

MAINTENANCE OPTION: This option prepares students to become maintenance supervisors. Initially, graduates may work as apprentice electricians or mechanics to gain experience in repairs and planned maintenance. After certification is obtained, they may become involved with maintenance planning, working as or with the chief mine mechanic or chief mine electrician.

PRODUCTION OPTION: This option prepares students to become mine supervisors or engineering aides. Initially, some of the duties are to run transit and act as survey party chief, keep mine maps up to date and make projections, take samples and run analyses, make time studies, and assist with materials-handling layouts.

SURFACE MINING OPTION: This option prepares students for work as engineering aides or as supervisors in surface mining. At first, graduates work as assistants to engineers or to other supervisors. After a period of training, graduates may become involved in such areas of mining as pit design, equipment utilization, environmental control, reclamation, and mine laws and regulations.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(15 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 66–67 credits

(This includes 15 credits of General Education courses.)

REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 43 credits

PRESCRIBED COURSES (43 credits)

| | | |
|--|---|---|
| CHEM 011(3), ECON 014 GS(3), GEOSC 020 GN(3), SPCOM 100 GWS(3) | X | — |
| CMPSC 101 GQ(3), E G 001(2), ENGL 015 GWS(3), MATH 087 GQ(5), 088 GQ(5), MCH T 111(3), MNG T 800(1), 804(3), 806(3), PHYS 150 DN(3)* | X | X |

REQUIREMENTS FOR THE OPTION: 23–24 credits

MAINTENANCE OPTION: 24 credits

PRESCRIBED COURSES (24 credits)

| | | |
|--|---|---|
| MNG T 801(3), 802(3), 807(3), 808(3), 809(3), 810(3), 811(3), MGMT 100(3) | — | X |
|--|---|---|

PRODUCTION OPTION: 23 credits

PRESCRIBED COURSES (20 credits)

| | | |
|---|---|---|
| MN PR 061(3), MNG 023(3), 030(2), MNG T 801(3), 802(3), 803(3), 805(3) | — | X |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (3 credits)

| | | |
|---------------------------------------|---|---|
| Select 3 credits in mining technology | — | X |
|---------------------------------------|---|---|

SURFACE MINING OPTION: 24 credits

PRESCRIBED COURSES (21 credits)

| | | |
|---|---|---|
| MN PR 061(3), MNG 023(3), MNG T 815(3), 816(3), 817(3), 818(3), 819(3) | — | X |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (3 credits)

| | | |
|---------------------------------------|---|---|
| Select 3 credits in mining technology | — | X |
|---------------------------------------|---|---|

*See department for appropriate course.

NUCLEAR ENGINEERING TECHNOLOGY (2 NET)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*
PROFESSOR MASOUD FEIZ, *Program Chair, Beaver Campus*

This major is designed to provide technically trained personnel to support the rapidly developing nuclear industry. The wide scope of training prepares the nuclear technician for careers in radiation safety, reactor operations, radioisotope handling, nuclear and control instrumentation, fuel fabrication, and health physics. A nuclear technician may work as a radiological safety specialist, engineering aide, or enter training as a reactor operator at a nuclear facility.

Graduates of the Nuclear Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology offered at Penn State Harrisburg. Or they may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Nuclear Engineering Technology, a minimum of 70 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

| <i>Scheduling Recommendation by Semester Standing</i> | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits
(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 61 credits
(This includes 12 credits of General Education courses: 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

| PRESCRIBED COURSES (61 credits) | | |
|---|---|---|
| CHEM 011(3), CMPSC 101 GQ(3), EE T 101(3), 109(1), EG T 101(1), 102(1), ENGL 015 GWS(3), 202C GWS(3), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN (3), SPCOM 100 GWS(3) | X | — |
| NE T 201(3), 202(4), 203(3), 204(3), 205(2), 212(3), 214(3), 215(3), PHYS 151(3) | — | X |

NURSING (2NURS)

PROFESSOR JANET A. WILLIAMSON, *Director, School of Nursing*

This program helps prepare graduates for employment primarily in hospitals and long-term care facilities. Graduates provide nursing care to individuals with commonly occurring acute or chronic health problems. After earning the associate degree, students are eligible to take the registered nurse examination for licensure by the State Board of Nursing. National League for Nursing accreditation of the program will be requested following graduation of the first class.

Students must carry liability insurance and have an annual health examination. Students are also responsible for their own transportation to clinical settings. The use of a car may be necessary.

Graduates of this major may qualify for admission t the baccalaureate degree program in Nursing.

For the Associate in Science degree in Nursing, a minimum of 67 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(15 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 61 credits

(This includes 15 credits of General Education courses; 3 credits of GN courses; 3 credits of GQ courses; 6 credits of GS courses; 3 credits of GWS courses)

PRESCRIBED COURSES (58 credits)

| | | |
|---|---|---|
| BIOL 029(4), 041 DN(3), 042(1), ENGL 015 GWS(3), HD FS 129 GS(3), PSY 002 GS(3), SOC 001 GS(3), NURS 101(8), 102(8) | X | — |
| MICRB 106 GN(2), 107 GN(1), NURS 201(9), 202(10) | — | X |

ADDITIONAL COURSES (3 credits)

| | | |
|--|---|---|
| Select 3 credits from MATH 005 GQ or above | — | X |
|--|---|---|

PHYSICAL THERAPIST ASSISTANCE (2 PTA)

PROFESSOR RICHARD ST. PIERRE, *in charge*

The Physical Therapist Assistance program prepares individuals to become skilled technical health workers who assist the physical therapist in patient treatment. Students develop knowledge and skills in the appropriate use of equipment and exercise associated with various physical therapy treatment modalities. In order to accomplish these tasks, the major utilizes a combination of basic science and nonscience course work coupled with health education courses specifically designed for the physical therapist assistant. The program culminates with a full semester of clinical experience.

To enter this major, students must have a high school diploma and satisfactory Scholastic Aptitude Test scores.

The size of each entering class is limited so that optimal clinical experiences and practical application situations can be maintained. Students are admitted into the program only during the fall semester and must progress through the program in the prescribed manner. Clinical affiliations are maintained over a wide geographical area. Students may be required to make special housing and transportation arrangements during the clinical phase.

For the Associate in Science degree in Physical Therapist Assistance, a minimum of 71 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(6 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

ELECTIVES: 6 credits

REQUIREMENTS FOR THE MAJOR: 50 credits

(This includes 6 credits of General Education courses; 3 credits of GWS courses; 3 credits of GN courses.)

*Scheduling Recommendation
by Semester Standing*

1-2 3-4

PRESCRIBED COURSES (50 credits)

BIOL 029(4), 041 DN(3), 042(3), HL ED 384(3), 800(3),

802(1), 803(3), 807(1), 808(1)

PHYS 001 GN(3)

ENGL 202C GWS(3), HL ED 303(3), 801(4),

804(3), 805(2)

HL ED 806(12)*

| | | | |
|---|---|---|---|
| X | — | — | — |
| X | X | — | — |
| — | X | — | — |
| — | — | — | X |

SCIENCE (2SC)PROFESSOR GARY MULLEN, *in charge*

The Science major is designed primarily to provide for the basic educational needs of students who want to pursue professional programs in various medically related fields. The program provides a fundamental group of science courses of value to those who seek positions in government or industry where such knowledge is necessary or desirable.

The Radiologic Technologist Radiographer option requires seven semesters (five semesters and two summer sessions) of formal classroom and clinical education. In the clinical practicum, the student is required to demonstrate competency in performing examinations under supervision in the radiology department of a participating hospital. This generally requires between 1,800 and 2,400 clock hours. In addition to receiving the Associate in Science degree, the student who successfully completes the major is eligible to take the American Registry of Radiologic Technologists (ARRT) examination for certification.

Graduates of the General option of the Science major may qualify for admission to the baccalaureate degree major in Mathematical Sciences offered at Penn State Harrisburg.

For the Associate in Science degree in Science, 66–74 credits are required.

*Scheduling Recommendation
by Semester Standing*

1-2 3-4 5-6 7

GENERAL EDUCATION: 21 credits

(12–15 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)**REQUIREMENTS FOR THE MAJOR: 57–65 credits**

(This includes 12–15 credits of General Education courses. For the Biotechnology option: 3 credits of DN courses; 3 credits of GQ courses; 3 credits of GS courses; 6 credits of GWS courses. For the General and RTR options: 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 13 credits

PRESCRIBED COURSES (13 credits)

BIOL 101 DN(4), PHYS 150 DN(3)

ENGL 015 GWS(3)

PHYS 151(3)

| | | | |
|---|---|---|---|
| X | — | — | — |
| X | X | — | — |
| — | X | — | — |

*Courses that include clinical education experiences may require the student to travel long distances or obtain housing near the assigned clinic. Housing and transportation arrangements are the responsibility of the student.

*Scheduling Recommendation
by Semester Standing*

| 1-2 | 3-4 | 5-6 | 7 |
|-----|-----|-----|---|
|-----|-----|-----|---|

REQUIREMENTS FOR THE OPTION: 44-52 credits**BIOTECHNOLOGY OPTION: 48 credits****PRESCRIBED COURSES (48 credits)**

CHEM 012 DN(3), 013 DN(3), 014 DN(1), 015 DN(1),

ENGL 202C GWS (3), MATH 006 GQ(3),

MICRB 201(3), 202(2), STAT GQ(4)

BIOCH 001 GN(3), CHEM 034(3), 035(3), MICRB 231(3),

120(4), 121A(3), 121B(3), SOC 005 GS(3)

| | | | |
|---|---|---|---|
| X | — | — | — |
| — | X | — | — |

GENERAL OPTION: 44 credits**PRESCRIBED COURSES (23 credits)**

BIOL 029(4), CHEM 011(3), MATH 110 GQ(4)

BIOL 041 DN(3), CMPSC 101 GQ(3), MICRB 106 GN(2),

107 GN(1), SPCOM 100 GWS(3)

| | | | |
|---|---|---|---|
| X | — | — | — |
| — | X | — | — |

ADDITIONAL COURSES (18 credits)

MATH 005 GQ or 006 GQ(3)

CHEM 034 or BIOCH 001 GN(3)

Select 12 credits from the following biological,

mathematical, and physical science courses:

ASTRO 001 GN(3), BIOL 033 DN(3), 042(1),

102 DN(4), BI SC 003 GN(3), CHEM 035(3), 102(3),

MATH 111 GQ(2), PHIL 212 GQ(3), PHYS 297(3)

or STAT 200 GQ(4)

| | | | |
|---|---|---|---|
| X | — | — | — |
| — | X | — | — |
| X | X | — | — |

SUPPORTING COURSES AND RELATED AREAS (3 credits)

Select 3 credits from social and behavioral sciences

| | | | |
|---|---|---|---|
| X | X | — | — |
|---|---|---|---|

RADIOLOGIC TECHNOLOGIST RADIOGRAPHER OPTION: 52 credits**PRESCRIBED COURSES (52 credits)**

BIOL 029(4), 033 DN(3), CHEM 011(3), CMPSC 100(3),

HUMAN 101 DH(3), MATH 005 GQ(3), 006 GQ(3),

PHYS 297(3), R T R 101(3), 102(3)

BIOL 041 DN(3), R T R 103(3), 104(3),

SPCOM 100 GWS (3)

R T R 105(3), 106(3)

R T R 107(3)

| | | | |
|---|---|---|---|
| X | — | — | — |
| — | X | — | — |
| — | — | X | — |
| — | — | — | X |

SOCIOLOGY (2ESOC)PROFESSOR JOSEPH FAULKNER, *in charge*

This major introduces students to the study of human groups and their relationships to each other and to the environment. It enables students to gain some proficiency in the scientific study of group structures and processes. A further objective is to help students become more skillful in working with community institutions, agencies, and organizations either through gainful employment or as a volunteer.

Graduates may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Humanities, or Public Policy offered at Penn State Harrisburg.

For the Associate in Arts degree in Sociology, a minimum of 60 credits is required.

| Scheduling Recommendation by Semester Standing | | |
|---|--|-----|
| 1-2 | | 3-4 |

GENERAL EDUCATION: 21 credits
(See description of General Education in front of *Bulletin*.)

ELECTIVES: 9 credits

REQUIREMENTS FOR THE MAJOR: 30 credits

| PRESCRIBED COURSES (6 credits) | | |
|---|---|---|
| SOC 001 GS(3) | X | — |
| SOC 007(3) | — | X |
| ADDITIONAL COURSES (12 credits) | | |
| Select 12 credits from SOC 003 GS, 005 GS, 012 DS, 013 DS, 015 DS, 023 DS, 030 DS, 047, 055 DS | X | X |
| SUPPORTING COURSES AND RELATED AREAS (12 credits) | | |
| Select 12 credits in arts, humanities, social and behavioral sciences | X | X |

SURVEYING TECHNOLOGY (2 SRT)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*
PROFESSOR LEO CORBETT, *Program Chair, Wilkes-Barre Campus*

The objectives of the major are to provide a knowledge of the elements of surveying as applied to construction, land, topographic, geodetic, city, and photogrammetric surveys, and to develop trained personnel who understand the relation between the precision of measurements and the interpretation of data in addition to having an appreciation of the skills and equipment needed to make precise measurements in the field of surveying.

Graduates of the Surveying Technology major may qualify for admission to the baccalaureate degree major in Structural Design and Construction Engineering Technology offered at Penn State Harrisburg.

For the Associate in Engineering Technology degree in Surveying Technology, a minimum of 72 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

| Scheduling Recommendation by Semester Standing | | |
|---|--------|-----|
| 1-2 | Summer | 3-4 |

GENERAL EDUCATION: 21 credits
(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63–64 credits
(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

| PRESCRIBED COURSES (61 credits) | | |
|--|---|-----|
| CE T 109(2), 111(3), 112(3), 118(2), EG T 101(1), 102(1), ENGL 015 GWS(3), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN(3), 151(3) | X | — — |

*Scheduling Recommendation
by Semester Standing*

| | | |
|-----|--------|-----|
| 1-2 | Summer | 3-4 |
|-----|--------|-----|

| | | | |
|---|---|---|---|
| CE T 210(2), 214(2), 215(3), 216(3), 290(3), CMPSC 101 GQ(3), EG T 103(2), 104(1), ENGL 202C GWS(3), SPCOM 100 GWS(3) | — | X | — |
| CE T 113(4) | — | — | X |

ADDITIONAL COURSES (2–3 credits)

Select 2–3 credits from the following technical courses:

| | | | |
|---|---|---|---|
| CE T 217, 261, 297, CHEM 011, 012 DN, CMPSC 102, EE T 100, EG T 201, 297, IE 315, IE T 105, MATH 140 GQ, 141 GQ, 231, or ME T 111 | — | — | X |
|---|---|---|---|

TELECOMMUNICATIONS TECHNOLOGY (2TELT)

PROFESSOR WAYNE HAGER, *Department Head, General Engineering, University Park Campus*

PROFESSOR HAROLD GROFF, *Program Chair, Wilkes-Barre Campus*

The field of telecommunications includes the transmission of voice and digital signals by telephone, telegraph, radio, and satellite. Graduates of the Telecommunications Technology major will be engineering technicians who help select, design, install, operate, maintain, trouble-shoot, and repair modern telecommunications systems. Future uses for telecommunications systems include electronic mail, electronic shopping, home computer terminal tie-ins, remote utility meter reading, and the transmission of biomedical data between hospitals, libraries, and doctors' offices.

Graduates of the Telecommunications Technology major may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Harrisburg or Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Telecommunications Technology, a minimum of 72 credits is required.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63–65 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (62 credits)

| | | | |
|---|---|---|---|
| CMPSC 101 GQ(3); EE T 101(3), 109(1), 114(3), 118(1), 205(1), 210(3), EG T 101(1), 102(1), ENGL 015 GWS(3), ENGR 002(1), MATH 087 GQ(5), 088 GQ(5), TELCM 140(2) | X | — | |
| EE T 117(3), 120(1), 211(4), 216(3), 221(1), PHYS 150 DN(3), 151(3), SPCOM 100 GWS(3), TELCM 241(3), 242(1), 243(3), 244(1) | — | | X |

Scheduling Recommendation
by Semester Standing
1-2 3-4

ADDITIONAL COURSES (1-3)

Select 1-3 courses from the following technical courses:
BE T 297, CE T 261, CMPSC 102, EE T 211, 213, 297,
EG T 203, IE 315, MCH T 111, ME T 207

— X

WILDLIFE TECHNOLOGY (2WLT)

PROFESSOR MICHAEL J. LACKI, *in charge*

The Wildlife Technology major prepares students in the techniques of wildlife management. Personnel trained in this field are needed to assist in the applied phases of natural resource management, wildlife biology, range management, and the care, maintenance, and propagation of animals. Graduates should be able to support professionals in wildlife biology, park managers, game refuge managers, and laboratory technicians in research.

For the Associate in Science degree in Wildlife Technology, a minimum of 65 credits is required.

Scheduling Recommendation
by Semester Standing
1-2 3-4

GENERAL EDUCATION: 21 credits

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 44 credits

PRESCRIBED COURSES (44 credits)

CE T 109(2), FOR 240(3), 250(3), WILDL 101(3),
103(3), 106(4)
AG 113(1), FOR 242(3), HL ED 013 GHS(1),
WILDL 204(4), 207(3), 208(3), 209(4),
211(4), 213(3)

X —

— X

COURSE DESCRIPTIONS

CREDITS AND HOURS

Credits are awarded on the semester-hour basis. According to Senate Policy 42-23, a total of at least forty hours of work planned and arranged by the University faculty is required for the average student to gain 1 credit. While the distribution of time varies from course to course, generally, one-third of the time is devoted to formal instruction, such as lecture, recitation, laboratory, field trips, etc., and two-thirds of the time to outside preparation.

Credits, classroom work, and practicum or laboratory work are indicated by three numbers in parentheses immediately following the course title—for example (3:3:0):

1. The first number shows the maximum credits authorized for the course.
2. The second number shows the periods of classroom work (including lecture, recitation, class discussion, demonstration, or various combinations of these).
3. The third number shows the periods of practicum work (including laboratory, shop work, studio, drafting room, field trips, etc.).

A typical class period is fifty minutes.

Courses numbered from 1 to 399 carry baccalaureate credit and are required in most of the associate degree majors. Elective credit courses vary from campus to campus and semester to semester, and all of the courses listed here are not offered at each campus. Students can obtain information about the specific course offerings for a given campus from the appropriate *Schedule of Classes*. Descriptions of prerequisite courses listed here by number only may be found in the *Baccalaureate Degree Programs Bulletin*.

GENERAL EDUCATION SUFFIXES

The following suffixes are used in the course description section to designate courses that have been approved for General Education:

Skills Courses

Writing/Speaking—GWS
Quantification—GQ
Health Sciences—GHS
Physical Education—GPE

Breadth Courses

Natural Sciences—GN
Arts—GA
Humanities—GH
Social and Behavioral Sciences—GS

Depth Courses

Natural Sciences—DN
Arts—DA
Humanities—DH
Social and Behavioral Sciences—DS

ACCOUNTING (ACCTG)

150. INTERMEDIATE ACCOUNTING (3:3:0) Financial accounting statements, concepts, and procedures; assets, liabilities, owners' equity, statement analysis. Prerequisite: ACCTG 200.

170. NOT FOR PROFIT ACCOUNTING (3:3:0) Accounting procedures designed to meet the environmental characteristics of nonprofit and governmental entities. Prerequisite: ACCTG 200.

200. INTRODUCTORY FINANCIAL ACCOUNTING (3:2-1/2:1) Fundamentals of the collection, recording, summarization, and interpretation of accounting data.

204. INTRODUCTORY MANAGERIAL ACCOUNTING (3:2-1/2:1) Actual and standard cost systems; managerial uses of cost data. Prerequisite: ACCTG 200.

AGRICULTURAL ECONOMICS (AG EC)

101. (DS) INTRODUCTION TO AGRICULTURAL ECONOMICS (3:3:0) Application of economic principles to resource allocation problems in the production, marketing, and consumption of food and agricultural products. Not open to students in the Agricultural Economics and Rural Sociology or Agricultural Business Management major or students who have completed ECON 302.
102. INTRODUCTION TO FOOD AND AGRICULTURAL MARKETING (3:3:0) Comprehensive theoretical and descriptive survey of farm and food products marketing from the perspective of producers, marketing middlemen, and consumers.
106. INTRODUCTION TO FARM MANAGEMENT (3:3:0) Organizing and operating farm businesses for financial success; measuring profits; improving efficiency of labor, land, capital; getting started in farming.
200. INTRODUCTION TO AGRICULTURAL BUSINESS MANAGEMENT (3:3:0) Application of management principles and processes to agricultural business firms in their planning and operating in domestic and international markets.
208. FARM RECORDS AND ACCOUNTS (3:2:2) Practice in keeping, analyzing, interpreting records; systems of accounts to meet needs of individual farm situations.
232. MARKETING DAIRY PRODUCTS (3:3:0) Economics of marketing dairy products; factors affecting price, production, and utilization of milk; role of cooperatives; price plans and policies.
297. SPECIAL TOPICS (1-9)

AGRICULTURE—GENERAL (AG)

113. EXPLORING CAREERS IN AGRICULTURE (1:1:0) Examination of career opportunities in agriculture with an exploration of the relationship between student interest and career decisions.

AGRONOMY (AGRO)

028. PRINCIPLES OF CROP MANAGEMENT (3:2:2) Biological and agronomic principles applied to production and management of major feed and forage crops of the northeastern United States. Prerequisites: 6 credits in biological science.
200. SOIL RESOURCES AND LAND USE (3:2:2) Introduction to soils, with emphasis on the relation of soil characteristics to land use, conservation, and environmental quality. Students who have received credit for AGRO 001 or 217 may not schedule this course. Prerequisites: 3 credits each in a physical and biological science.

AMERICAN STUDIES (AM ST)

100. (GH) INTRODUCTION TO AMERICAN STUDIES (3:3:0) A study of selected attempts to identify and interpret movements and patterns in American culture. Prerequisite: third-semester standing.
105. (DH) AMERICAN POPULAR CULTURE AND FOLKLIFE (3:3:0) Survey of popular culture, folk-life, and ethnicity, synthesizing material from such areas as literature, media, entertainment, print, music, and film.
196. (ENGL 196) INTRODUCTION TO AMERICAN FOLKLORE (3:3:0) A basic introduction to verbal and nonverbal folklore stressing the basic procedures of collection, classification, and analysis.
197. (ENGL 197) AMERICAN FOLK SONG IN ENGLISH (3:3:0) British songs in America; native repertoires, white and black; folk ballad; and musical development.

ANIMAL SCIENCE (AN SC)

007. HORSE PRODUCTION AND MANAGEMENT (3:2:2) Principles of selection, breeding, feeding, management, and marketing of horses; emphasis on light leg horses.
100. ANIMAL AGRICULTURE (3:2:2) Magnitude, importance, and complexity of the beef, dairy, horse, poultry, sheep, and swine industries, with particular emphasis on Pennsylvania agriculture.

201. MEAT ANIMAL MANAGEMENT (3:3:0) Principles of nutrition, breeding, physiology, health, and marketing applied to improving the performance and efficiency of meat production. Not intended for Animal Production majors.
202. DAIRY SCIENCE AND INDUSTRY (3:2:2) Introduction to dairy industry; milk composition, production, marketing. Dairy cattle breeding, feeding, housing, husbandry, management, and selection. Intended for non-Dairy Production majors.

ANTHROPOLOGY (ANTH)

001. (GS) INTRODUCTORY ANTHROPOLOGY (3:3:0) Prehistoric and traditional peoples and cultures; traditional customs and institutions compared with those of modern society.
002. (GS) INTRODUCTION TO ARCHAEOLOGY (3:3:0) This course surveys basic approaches used by archaeologists to interpret prehistoric human cultural patterns.
008. (DS) AZTECS, MAYAS, AND INCAS (3:3:0) Comparative survey of the development of the pre-Columbian Latin American civilizations.
009. (DS) RISE OF CIVILIZATION IN THE OLD WORLD (3:3:0) Evolution of Old World complex societies, especially the first great civilizations of Mesopotamia, Egypt, China, and the Indus Valley.
011. (DS) INTRODUCTORY NORTH AMERICAN ARCHAEOLOGY (3:3:0) Introduction to archaeology of the North American Indians; site methods, and results of research interpreted in cultural history.
021. (GN) INTRODUCTORY BIOLOGICAL ANTHROPOLOGY (3:3:0) The role of human biology and evolution in culture, society, and behavior.
045. (GS) CULTURAL ANTHROPOLOGY (3:3:0) Beginnings of human culture; economic life, society, government, religion, and art among traditional peoples.
146. (DS) NORTH AMERICAN INDIANS (3:3:0) An introduction to the cultures of the indigenous peoples of North America, north of Mexico, and the effect of contact.

ARABIC (ARAB)

001. ELEMENTARY MODERN STANDARD ARABIC (4:3:2) Introduction to reading, writing, pronunciation, and aural comprehension of modern standard Arabic; simple grammatical forms; basic vocabulary.
002. ELEMENTARY MODERN STANDARD ARABIC II (4:3:2) Continued audio-lingual practice in class and language laboratory of modern standard Arabic; continuation of grammar and vocabulary building. Prerequisite: ARAB 001.
003. INTERMEDIATE MODERN STANDARD ARABIC (4:3:2) Continued audio-lingual practice in class and language laboratory of modern standard Arabic; complex grammatical forms, vocabulary building principles. Prerequisite: ARAB 002.
296. INDEPENDENT STUDIES (1-18)
297. SPECIAL TOPICS (1-9)

ARCHITECTURAL ENGINEERING TECHNOLOGY (AE T)

101. BUILDING MATERIALS (3:3:0) Structural and architectural use of building materials and construction assemblies.
102. METHODS OF CONSTRUCTION (3:1:5) Materials and methods of construction used in buildings, as expressed in drawings. Prerequisite or concurrent: AE T 101, EG T 101, and 102.
103. PLUMBING AND FIRE PROTECTION (3:2:2) Layout of plumbing and fire protection in buildings to meet code and usage requirements. Prerequisite or concurrent: AE T 102.
113. SITE PLANNING (2:1:2) Energy conservation through optimum site utilization, contours, cut and fill calculations, storm drainage, spot grading, and finish grading.
204. HEATING, VENTILATING, AND AIR CONDITIONING LAYOUT (3:2:2) Fundamental calculations and layout of systems in buildings. Prerequisite: AE T 103. Or concurrent: AE T 102.
206. ARCHITECTURAL PRESENTATION (2:1:2) Visual communication through architectural presentation drawings. Line, value, color, and composition. Prerequisite: E G 001 and 003.
207. ADVANCED CONSTRUCTION METHODS (3:1:5) Integration of materials and systems in working drawings. Prerequisite: fourth-semester standing.

209. **STRUCTURE DESIGN (3:2:3)** Elementary principles of structural design and detailing in timber, steel, and reinforced concrete; use of handbooks; fundamentals of structural and architectural drafting. Prerequisites: AE T 102, MCH T 213, or EG T 201.
210. **ARCHITECTURAL ENGINEERING OFFICE PRACTICE (3:3:0)** Procedures involved in production of contract documents, both drawings and specifications. Prerequisite: fourth-semester standing.
212. **BUILDING LIGHTING AND ELECTRICAL LAYOUT (3:2:2)** Layout of lighting and electrical distribution in buildings.
213. **SITE PLANNING (2:1:2)** Energy conservation through optimum site utilization, contours, cut and fill calculations, storm drainage, spot grading, and finish grading.
214. **STEEL CONSTRUCTION (3:2:2)** Strength of materials as applied to the design of simple steel structures. Prerequisites: AE T 102, MCH T 111.
215. **CONCRETE CONSTRUCTION (3:2:2)** Fundamentals of design and construction of reinforced concrete structures. Prerequisites: AE T 102, MCH T 111.
297. **SPECIAL TOPICS (1-9)**

ART (ART)

001. (GA) **THE VISUAL ARTS AND THE STUDIO: AN INTRODUCTION (3:3:0)** Introduction to the visual arts; the practice of the visual arts; social, cultural, and aesthetic implications of studio activity.
100. (GA) **CONCEPTS AND CREATION IN THE VISUAL ARTS (3:1:4)** A study of the personal and cultural foundations of artistic creation and practice of creative production in the art studio.
110. (DA) **DESIGN: TWO DIMENSIONAL (3:2:4)** Introduction to design in two dimensions. Pictorial space and the principles of visual organization of the flat surface.
111. (DA) **DESIGN: THREE DIMENSIONAL (3:2:4)** Introduction to design in three dimensions. Principles of visual organization in working with actual space and volume.
120. (DA) **INTRODUCTION TO DRAWING (3:2:4)** The study and practice of basic drawing as a way of understanding and communicating.
121. **DRAWING: TECHNIQUES, MATERIALS, AND TOOLS (3:2:4)** Drawing with an emphasis on organization and the development of drawing skills through a variety of techniques, materials, and tools. Prerequisite: ART 120.
130. (DA) **INTRODUCTION TO SCULPTURE I (3:2:4)** An introduction to sculpture consisting of lectures, demonstrations, and basic studio work coordinated to cover a broad range of processes.
180. (DA) **CERAMIC ARTS (3:2:4)** Introduction to potter's wheel techniques; experiments with decorative application; includes the technical concerns for clay, glazes, and kilns. For non-Art majors.
215. (DA) **INTRODUCTORY FIBER ARTS (3:1:5)** Theory development and introduction to fiber arts, with emphasis on the loom and nonloom textile art processes.
217. (DA) **INTRODUCTION TO METAL ARTS (3:2:4)** Introduction to fundamental jewelry-making and small-scale metalsmithing processes, including conceptualization, fabrication, surface treatment, and finishing of metalwork.
240. (DA) **INTRODUCTION TO PRINTMAKING: INTAGLIO (3:2:4)** Instruction and practice in the fundamentals of the intaglio process; its relationship to the design and meaning of the print.
241. (DA) **INTRODUCTION TO PRINTMAKING: LITHOGRAPHY (3:2:4)** Instruction and practice in the fundamentals of the lithographic process; its relationship to the design and meaning of the print.
250. (DA) **BEGINNING OIL PAINTING (3:2:4)** The materials and techniques of painting in oil and their uses in creative painting on panels and canvas.
251. (DA) **ACRYLIC PAINTING (3:2:4)** Introduction to the materials and techniques of creative painting with acrylic paints.
260. (DA) **BEGINNING WATERCOLOR PAINTING (3:2:4)** Transparent watercolor painting on various papers; knowledge of materials, development of skills and creativity.
270. (DA) **INTRODUCTION TO GRAPHIC DESIGN (3:2:4)** Orientation to graphic design and the methods of the designer; experimentation in language and visual symbolism in communication of ideas.
280. **INTRODUCTORY CERAMIC ARTS (3:2:4)** The fundamentals of ceramics, throwing, hand-building, and glazing; acquainting the student with ceramic materials, techniques, and philosophy. Prerequisite: 2 credits in studio art.
290. (DA) **PHOTOGRAPHY I (3:2:4)** Fundamental black-white techniques. Introduction to inherent qualities of photographic vision through study of historic/contemporary photography. Camera, light meter required.
296. **INDEPENDENT STUDIES (1-18)**

ART EDUCATION (A ED)

003. THE VISUAL ARTS IN THE ELEMENTARY SCHOOL (3:2:2) Understanding of children's art; development of some confidence in the student's own creative approach in the visual arts.
014. INTRODUCTORY CRAFTS FOR TEACHERS (3:1:5) Direct experience with materials such as wood, clay, metal, paper, textiles, and plastics in relationship to the creative needs of children.

ART HISTORY (ART H)

100. (GA) INTRODUCTION TO ART (3:3:0) An approach to the understanding of art through a critical analysis of selected works of architecture, painting, and sculpture. Students who have passed ART H 110 may not schedule this course.
110. SURVEY OF WESTERN ART (3:3:0) General survey of major developments in architecture, painting, and sculpture in the Western world. Students who have passed ART H 100 may not schedule this course.
111. (GA) SURVEY OF WESTERN ART I (3:3:0) Survey of the major monuments and trends in the history of art from prehistory through the late Gothic period. Students who have passed ART H 110 may not schedule this course.
112. (GA) SURVEY OF WESTERN ART II (3:3:0) Survey of the major monuments and trends in the history of art from the Renaissance to the modern era. Students who have passed ART H 110 may not schedule this course.
120. (GA) SURVEY OF EASTERN ART (3:3:0) A general survey of the great periods of art in India, Central Asia, China, Japan, and the Islamic world.
211. (DA) ANCIENT ARCHITECTURE (3:3:0) Architecture of Egypt, the Ancient Near East, Greece, and Rome.
212. (DA) MEDIEVAL ARCHITECTURE (3:3:0) Architecture of the Christian church from its origin until the Renaissance, with special attention to medieval construction and design.
213. (DA) RENAISSANCE-BAROQUE ARCHITECTURE (3:3:0) Survey of architecture from the fifteenth through the eighteenth century in Western Europe.
214. (DA) MODERN ARCHITECTURE (3:3:0) Architecture and related arts of sculpture and painting from the end of the eighteenth century to the present day. Nontechnical in nature.
301. (DA) EGYPTIAN AND MESOPOTAMIAN ART (3:3:0) Art of the Ancient Near East, including Egypt, Mesopotamia, and neighboring civilizations.
303. (DA) ITALIAN RENAISSANCE ART (3:3:0) The major arts in Italy from the thirteenth century A.D. through the Renaissance; emphasis on sculpture and painting.
304. (DA) SOUTHERN BAROQUE PAINTING (3:3:0) Seventeenth-century painting in Italy, France, and Spain. Emphasis will be on Italy as the vanguard country.
305. (DA) EUROPEAN ART FROM 1780-1860 (3:3:0) A survey of painting and sculpture in Europe from the beginnings of Neoclassicism through the Realist movement. Prerequisite: ART H 100 or 110 or 112.
306. (DA) ENGLISH ART (3:3:0) Survey of English art, emphasizing the Middle Ages and the eighteenth and early nineteenth centuries.
307. (DA) AMERICAN ART (3:3:0) History of art in the English colonies and the United States from the seventeenth century to the present.
311. (DA) GREEK AND ROMAN ART (3:3:0) Greek and Roman art, with emphasis on painting and sculpture.
312. (DA) ROMANESQUE AND GOTHIC ART (3:3:0) Survey of the architecture, sculpture, and painting of the Christian church in western Europe from 1000 to 1500.
313. (DA) NORTHERN RENAISSANCE ART (3:3:0) Art in northern Europe in the fifteenth and sixteenth centuries, emphasizing painters such as Van Eyck, Dürer, and Bruegel.
314. (DA) ART IN THE AGE OF REMBRANDT (3:3:0) Dutch and Flemish painting in the seventeenth century.
320. (DA) CHINESE ART (3:3:0) A general survey of the great periods of Chinese art from the Shang dynasty until the modern period.
324. (DA) ROCOCO ART (3:3:0) Eighteenth-century art in western Europe, with emphasis on artists such as Watteau, Fragonard, Falconet, Le Gros, Tiepolo, Guardi, Neumann.
325. (DA) MODERN AND CONTEMPORARY ART: SURVEY FROM IMPRESSIONISM TO THE PRESENT (3:3:0) A survey of painting and sculpture from Monet through the present. Prerequisite: ART H 100 or 110 or 112 or 305.
330. (DA) ISLAMIC ART (3:3:0) Survey of the art and architecture of Islamic lands from the late seventh century until the eighteenth century.
342. (DA) RUSSIAN ART AND ARCHITECTURE (3:3:0) Survey of Russian art and architecture from the foundation of the Russian state through the Soviet era.

THE ARTS

THE ARTS (ARTS)

001. (GA) THE ARTS (3:3:0) Developing critical perception, knowledge, and judgments through an examination of the basic concepts common among the arts.
005. (GA) PERFORMING ARTS (3:2:3) Introduction to music, dance, and theatre. Orientation to the aesthetics, theory, and practice of professional performance.
296. INDEPENDENT STUDIES (1-18)

ASTRONOMY (ASTRO)

001. (GN) ASTRONOMICAL UNIVERSE (3:3:0) Nonmathematical description of the astronomical universe and the development of scientific thought. For nonscience majors. Students who have passed ASTRO 090 may not schedule this course.
- * 010. (GN) ELEMENTARY ASTRONOMY (2:2:0) Nonmathematical description of stars, planets, galaxies, and the universe. For nonscience majors. Students who have passed ASTRO 001 or 090 may not schedule this course.
- * 011. (GN) ELEMENTARY ASTRONOMY LABORATORY (1:0:2) Selected experiments and data analysis to illustrate major astronomical principles and techniques. Telescopic observations of stars and galaxies. For nonscience majors. Prerequisite or concurrent: ASTRO 001 or 010.
090. (GN) DESCRIPTIVE ASTRONOMY (3:2:2) Nonmathematical presentation of methods and results of astronomical exploration of the solar system, stars, and galaxies. For nonscience majors. Students who have passed ASTRO 001 may not schedule this course.
291. (DN) ASTRONOMY OF THE SOLAR SYSTEM (3:3:0) Methods and instruments of the astronomer and results obtained by applying them to our solar system. Prerequisite or concurrent: MATH 140.
292. (DN) ASTRONOMY OF STELLAR SYSTEMS (3:3:0) Methods of study and knowledge of the universe beyond the limits of the solar system. Prerequisites or concurrent: MATH 140.

BIOCHEMISTRY (BIOCH)

001. (GN) BIOCHEMICAL SCIENCE (3:3:0) Biochemistry of important functions of man and animals, including genetics, nutrition, metabolic and disease processes, and environmental relationships.

BIOLOGICAL SCIENCE (BI SC)

001. (GN) STRUCTURE AND FUNCTION OF ORGANISMS (3:3:0) Origin, development, and cellular basis of life; fundamental principles, processes, and structures of organisms. Students who have passed BIOL 027, 041, 101, or 102 may not schedule this course.
002. (GN) GENETICS, ECOLOGY, AND EVOLUTION (3:3:0) How living organisms pass on their inheritance, how plants and animals came to be what they are, and how they now react. Students who have passed BIOL 033, 101, 102, or 222 may not schedule this course.
003. (GN) ENVIRONMENTAL SCIENCE (3:3:0) Kinds of environments; past and present uses and abuses of natural resources; disposal of human wastes; prospects for the future. Students who have passed BIOL 210 or any other upper-level ecology course in biology may not schedule this course.
004. (GN) HUMAN BODY: FORM AND FUNCTION (3:3:0) A general survey of structure and function—from conception, through growth and reproduction, to death. Students who have passed BIOL 029 and 041 may not schedule this course.

BIOLOGY (BIOL)

027. INTRODUCTION TO PLANT BIOLOGY (3:2:2) Cellular structure and organization; physiological processes; classification; reproduction and development; relationship of plant groups. Students who have passed BIOL 102 may not schedule this course.

*Students must take a combination of ASTRO 010 and 011 in order to obtain General Education credits in astronomy.

029. MAMMALIAN ANATOMY (4:2:4) Anatomy of a mammal, with special reference to that of man. Students who have passed BIOL 421 may not schedule this course.
033. (DN) GENETICS AND EVOLUTION OF THE HUMAN SPECIES (3:3:0) Human heredity and evolution, individual and social implications. Students who have passed BIOL 472 may not schedule this course.
041. (DN) PHYSIOLOGY (3:3:0) Normal functions of the animal body, with special reference to those of man. Students who have passed BIOL 472 may not schedule this course.
042. PHYSIOLOGY LABORATORY (1:0:2) Experiments demonstrating basic physiological principles, with special reference to man. Prerequisite or concurrent: BIOL 041.
101. (DN) PRINCIPLES OF BIOLOGY I (4:3:2) Introduction to cell biology; biology of vertebrates; overview of monerans, protists, and animals.
102. (DN) PRINCIPLES OF BIOLOGY II (4:3:2) Continuation of BIOL 101, with emphasis on plants and fungi; genetics of organisms and populations; evolution. Prerequisite: BIOL 101.

BIOMEDICAL EQUIPMENT TECHNOLOGY (BE T)

201. PHYSIOLOGICAL TRANSDUCERS (5:4:2) Study of the principles of operation and applications of devices used for the conversion of physiological events to electrical signals. Prerequisite: EE T 114.
202. BIOMEDICAL INSTRUMENTATION AND SYSTEMS (5:4:2) Introduction to the operating principles, maintenance, and analytic troubleshooting of electronic, fluid, and pneumatic biomedical equipment. Prerequisite: BE T 201.
203. BIOMEDICAL EQUIPMENT LABORATORY (Internship) (4:1:6) Practical experience, within or related to the hospital environment, on a variety of biomedical instruments. Prerequisites: BE T 204, BIOL 041.
204. MEDICAL AND CLINICAL EQUIPMENT (3:2:2) Principles of operation of clinical, medical radiography, intensive care, anesthesia, respiratory, non-invasive imaging, and emergency equipment; hospital electrical safety. Prerequisite: BE T 201.
205. HIGH-POWER MEDICAL EQUIPMENT (3:2:2) A study of high-power medical instrumentation using lumped-element p-n junction devices, crystals, and lasers. Prerequisite: EE T 114.
297. SPECIAL TOPICS (1-9)

BLACK STUDIES (BL ST)

100. (DS) EVOLVING STATUS OF BLACKS IN THE TWENTIETH CENTURY: INTERDISCIPLINARY PERSPECTIVES (3:3:0) An interdisciplinary team-taught exploration of the evolving status of Black Americans in the twentieth century. Emphasis on the civil rights movement.
145. (DH) [RL ST 145(DH)] AFRO-AMERICAN RELIGION (3:3:0) Afro-American religion from the slavery era to the civil rights movement and contemporary churches and sects.
146. (DH) [RL ST 146(DH)] THE LIFE AND THOUGHT OF MARTIN LUTHER KING, JR. (3:3:0) A survey of the civil rights leader, including his religious beliefs, intellectual development, and philosophy for social change.

BUILDING ENERGY SYSTEMS TECHNOLOGY (BES T)

101. INTRODUCTION TO BUILDING ENERGY SYSTEMS (2:1:2) Introduction to building energy systems technology from the standpoint of history, economics, and energy.
204. ANALYSIS OF BUILDING ENERGY SYSTEMS (3:1:5) Comprehensive analysis and application of building energy systems; calculation and layout; computer modeling of systems. Prerequisite: fourth-semester standing.
206. PASSIVE SYSTEMS AND CONSERVATION METHODS (3:3:0) Passive concepts and design; earth sheltering; energy audits and conservation techniques; wood burning equipment.
207. LIQUID HEATING AND COOLING SYSTEMS (3:2:2) Water, steam, and refrigerant systems and components; pumps and piping; heat exchangers; fluid and components selection; power and controls. Prerequisites: BES T 101, ME T 281.
208. AIR HEATING, COOLING, AND VENTILATING SYSTEMS (3:2:2) Air systems and distribution components; fans and ductwork; heat exchange coils; dampers and controls; residential fired equipment operation. Concurrent: BES T 207.
209. NONTECHNICAL ASPECTS OF BUILDING ENERGY SYSTEMS TECHNOLOGY (3:2:2) Economic analysis techniques; cost estimating; job scheduling; legal aspects; warranties; professionalism. Prerequisite: BES T 101.
297. SPECIAL TOPICS (1-9)

BUSINESS ADMINISTRATION (B A)

100. INTRODUCTION TO BUSINESS (3:3:0) A comprehensive view of the contemporary environment of business.
195. COOPERATIVE PRACTICUM WITH BUSINESS OFFICES (3-6) Cooperative practical work with business offices under the supervision of the instructor.
250. PROBLEMS OF SMALL BUSINESS (3:3:0) Analysis of problems of the small firm, particularly for the student who wishes to venture into business. Prerequisite: 3 credits in economics.

BUSINESS LAW (B LAW)

243. LEGAL ENVIRONMENT OF BUSINESS (3:3:0) Social control through law: courts, basic policies underlying individual and contractual rights in everyday society. Prerequisite: third-semester standing.

BUSINESS LOGISTICS (B LOG)

301. BUSINESS LOGISTICS MANAGEMENT (3:3:0) Management of logistics function in firm, including physical supply and distribution activities such as transportation, storage facility location, and materials handling. Prerequisite: third-semester standing.
304. TRANSPORT SYSTEMS (3:3:0) Conceptual model of a transport system; environmental relationships; modal components and managerial conditions, with special application to the United States.
305. TRAFFIC MANAGEMENT (3:3:0) Analysis of traffic function in the logistics system. Evaluation of routes, rates, and shipping document procedures. Prerequisite: B LOG 301 or 304.

CHEMISTRY (CHEM)

011. INTRODUCTORY CHEMISTRY (3:2:2) Selected principles and applications of chemistry. Prior study of chemistry not assumed.
012. (DN) CHEMICAL PRINCIPLES (3-4) Basic concepts and quantitative relations. Prerequisite: Satisfactory performance on placement examination—students take CHEM 012 for 3 credits. Unsatisfactory performance on placement examination—students take CHEM 012 for 4 credits.
013. (DN) CHEMICAL PRINCIPLES (3:3:0) Continuation of CHEM 012, including introduction to the chemistry of the elements. Prerequisite: CHEM 012 or 017. Prerequisite or concurrent: CHEM 014.
014. (DN) EXPERIMENTAL CHEMISTRY (1:0:3) Introduction to quantitative experimentation in chemistry. Prerequisite or concurrent: CHEM 012.
015. (DN) EXPERIMENTAL CHEMISTRY (1:0:3) Continuation of CHEM 014, with emphasis on analytical procedures. Prerequisite: CHEM 014. Prerequisite or concurrent: CHEM 013.
017. (DN) INTRODUCTORY AND GENERAL CHEMISTRY (5:5:2) Introductory and general chemistry for students who are required to take additional chemistry, e.g., CHEM 013, but are unprepared for CHEM 012. Students may not receive credit for both CHEM 017 and CHEM 011 or 012.
023. INTRODUCTION TO MODERN ANALYTICAL CHEMISTRY (4:2:4) Contemporary methods of chemical and instrumental analysis, including potentiometric titration, specific ion electrodes, spectrophotometry, and chromatography. Prerequisite: CHEM 015.
034. ORGANIC CHEMISTRY (3:3:0) Introduction to organic chemistry, with emphasis on the properties of organic compounds of biochemical importance. Not open to those who have previously scheduled CHEM 037. Prerequisite: CHEM 011 or 012 or 017.
035. ORGANIC CHEMISTRY (3:2:4) Introduction to organic chemistry, with emphasis on the identification of organic compounds by characteristic chemical reactions and by spectroscopy. Prerequisite: CHEM 034.
036. LABORATORY IN ORGANIC CHEMISTRY (2:0:6) Basic laboratory operations; applications of theories and principles. Prerequisite: CHEM 038. Prerequisite or concurrent: CHEM 039 or 040.
037. ORGANIC CHEMISTRY (3:3:0) Introduction to organic chemistry, with emphasis on topics of particular relevance to mineral science, materials science, and engineering. Not open to those who have previously scheduled CHEM 034. Prerequisite: CHEM 011 or 012.
038. ORGANIC CHEMISTRY (4:4:0) Principles and theories; nomenclature; chemistry of the functional groups; applications of spectroscopy. Students may not receive credit for both CHEM 038 and 034. Prerequisite: CHEM 013.

039. ORGANIC CHEMISTRY (3:3:0) Continuation of CHEM 038 to include especially polyfunctional organic molecules and the organic chemistry of biologically important molecules. Students may not receive credit for both CHEM 039 and 040. Prerequisite: CHEM 038.
040. ORGANIC CHEMISTRY (2:2:0) Continuation of CHEM 038 to include especially polyfunctional organic molecules. Student may not receive credit for both CHEM 039 and 040. Prerequisite: CHEM 038.
102. ENVIRONMENTAL CHEMISTRY (3:3:0) Applications of chemistry to environmental problems, including air, water, thermal pollution; pesticides; drugs and birth control agents; food additives; etc. For non-Chemistry majors; Chemistry majors will not receive credit.
389. SPECIAL PROBLEMS AND RESEARCH (1-4) Designed for freshman or sophomore students who are prepared to undertake special problems and research by arrangement with a faculty member.
395. CHEMISTRY TEACHER ASSISTANT TRAINING (1-2) Instruction and practice in the role of the teaching assistant in the undergraduate chemistry laboratory.

CHINESE (CHNS)

001. ELEMENTARY CHINESE I (4:3:2) Introductory study of Chinese language, with audio-lingual practice of Mandarin Chinese and attention to structure and the writing system.
002. ELEMENTARY CHINESE II (4:3:2) Continued audio-lingual practice of Mandarin Chinese, further study of structure, practice in reading and writing Chinese. Prerequisite: CHNS 001.
003. INTERMEDIATE CHINESE (4:3:3) Continued audio-lingual practice of Mandarin Chinese, more extensive practice in reading and writing; study of Chinese culture. Prerequisite: CHNS 002.
004. INTERMEDIATE CHINESE (3:3:0) Readings in selected modern Chinese literature (short stories, plays, essays, and poems). Practice in simple composition. Prerequisite: CHNS 003.
110. CONVERSATION, READING, AND COMPOSITION (3:3:0) Readings in selected modern Chinese literature (short stories, plays, essays, poems) and other texts; practice in conversation and simple composition. Prerequisite: CHNS 003.
187. CHINESE FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a Liberal Arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
199. FOREIGN STUDY—BASIC CHINESE (1-8) Small group instruction in spoken and written Mandarin at the introductory level.
296. INDEPENDENT STUDIES (1-18)
297. SPECIAL TOPICS (1-9)
299. FOREIGN STUDY—INTERMEDIATE CHINESE (3-12) Small group instruction in spoken and written Mandarin at the intermediate level. Prerequisite: CHNS 002.

CIVIL ENGINEERING TECHNOLOGY (CE T)

109. TOPOGRAPHIC DRAWING (2:0:4) Conventional mapping symbols; constructing topographic maps from stadia notes; estimating grading quantities from topographic maps. Prerequisite: EG T 001, 102, or E G 010. Prerequisite or concurrent: CE T 111 or W F S 106.
111. PLANE SURVEYING (3:2:3) Theory of plane surveying; use, care, and adjustments of surveying equipment; traversing, areas, leveling, stadia, and plane table mapping. Prerequisite: MATH 087.
112. CURVES AND EARTHWORK (3:2:3) Computation and laying out of horizontal and vertical curves; calculation of cut and fill; setting slope stakes for construction. Prerequisite or concurrent: CE T 111, MATH 087.
113. PRACTICAL FIELD PROBLEMS (4:1:9) Geodetics, topography, field astronomy; route location; hydrographic surveys; land subdivision; use of electronic measuring devices. Prerequisites: CE T 112, 118.
118. ROUTE SURVEYING (2:0:4) Field and office operations connected with highway and railroad location; mass diagram as related to economical distribution of earthwork. Prerequisite: CE T 111. Concurrent: CE T 112.
210. STATISTICS AND LEAST SQUARES (3:3:0) Frequency distribution; histograms; frequency polygons; measures of central tendency; dispersion; uses of normal curve; least squares applied to surveying problems. Prerequisite: MATH 088.
214. PHOTOGRAMMETRY (2:1:2) Interpretation and use of aerial photographs; mapping by photogrammetric methods; application of aerial and terrestrial photographic surveying to specific engineering problems. Prerequisite: CE T 118.
215. GEODETIC SURVEYING (3:1:4) Precision vertical and horizontal control surveys; level nets; reciprocal leveling; triangulation; state plane coordinates; astronomic observations for azimuth and latitude. Prerequisites: CE T 111, MATH 087.
216. SPECIAL SURVEYS (3:1:4) Applications of surveying in hydrography, mining, construction, and subdivision planning; surveying registration law and professional ethics. Prerequisites: CE T 112, 113.

COMMUNICATIONS

217. CARTOGRAPHIC TECHNIQUES (2:0:4) Use of tools and equipment; projections used in art, advertising, navigation, government maps; relief methods; scribing techniques; map reproduction methods. Prerequisite: CE T 109.
261. FLUID FLOW (3:3:0) Elementary theory of fluid flow: hydrostatics; flow-through orifices, Venturi meters, and pipes; flow in open channels; theory of the centrifugal pump. Prerequisites: MATH 087, MCH T 111.
290. LEGAL ASPECTS OF SURVEYING (3:3:0) Legal principles affecting the determination of property boundaries; responsibilities of surveyors, attorneys, title companies, and the court. Prerequisite: CE T 111.
297. SPECIAL TOPICS (1–9)

COMMUNICATIONS (COMM)

100. (GS) THE MASS MEDIA AND SOCIETY (3:3:0) Mass communications in the United States; organization, role, content, and effects of newspapers, magazines, television, radio, books, and films. May not be used to fulfill requirements of any major in the School of Communications.
150. (GA) THE ART OF THE CINEMA (3:1:3) The development of cinema to its present state; principles of evaluation and appreciation; examples from the past and present.
205. (WMNST 205) WOMEN, MINORITIES, AND THE MEDIA (3:3:0) Analysis of historical, economic, legal, political, and social implications of the relationship between women, minorities, and the mass media.
260. NEWS WRITING AND REPORTING (3:2:2) News and news values; legal and ethical problems of reporting; writing and reporting news for the mass media. Prerequisites: ENGL 015 or 030; third-semester standing; typing proficiency.

COMPARATIVE LITERATURE (C LIT)

001. (GH) MASTERPIECES OF WESTERN LITERATURE THROUGH THE RENAISSANCE (3:3:0) Universal themes and cultural values in works by such writers as Homer, Sophocles, Chaucer, Dante, Boccaccio, Rabelais, and Cervantes.
002. (GH) MASTERPIECES OF WESTERN LITERATURE SINCE THE RENAISSANCE (3:3:0) Universal themes and cultural values in works by such writers as Voltaire, Goethe, Ibsen, Flaubert, Dostoevsky, Unamuno, Mann, and Borges.
003. (DH) MASTERPIECES OF LITERATURE FROM AFRICA (3:3:0) From traditional oral forms to contemporary experimental blends of African and Western literary styles. Readings in English.
004. (DH) MASTERPIECES OF LITERATURE FROM THE ORIENT (3:3:0) Major writings from China, Japan, and other East Asian countries, studied in translation and viewed as world literature.
010. (GH) THE FORMS OF WORLD LITERATURE: A GLOBAL PERSPECTIVE (3:3:0) The development of literature around the world—from epic, legend, lyric, etc., in the oral tradition, to modern written forms.
011. (DH) HEROISM IN WORLD LITERATURE (3:3:0) Cultural values and personal heroism in literary masterworks from a variety of countries and eras.
100. (DH) INTRODUCTION TO COMPARATIVE LITERATURE (3:3:0) Readings from various literatures, organized by themes (utopias, love, the monomyth or heroic quest, etc.) to introduce comparative literary study.
105. (DH) THE DEVELOPMENT OF LITERARY HUMOR (3:3:0) Literary humor expressed as satire, comedy, and farce—from ancient times to the present.
106. (DH) THE ARTHURIAN LEGEND (3:3:0) The legend of King Arthur from medieval Europe to modern Japan; the diverse ideals it has represented in different contexts.
107. (DH) THE LITERATURE OF EXPLORATION: INCREDIBLE VOYAGES FROM ANTIQUITY INTO THE FUTURE (3:3:0) Wanderings amid wonder, from Homer and Lucian and medieval travel legends to Renaissance exploration journals and modern interstellar imaginings.
108. (DH) NON-WESTERN MYTHS AND MYTHOLOGIES (3:3:0) The myths of non-Western cultures based on selected mythologies from around the world.
110. (DH) JEWISH LITERATURE IN EASTERN EUROPE, ISRAEL, AND AMERICA (3:3:0) Literary culture of the Jewish tradition from the Eastern European ghettos to the modern context in Israel and the United States.
111. (DH) LITERATURES OF MODERN INDIA (3:3:0) Sources, achievements, and principal themes of modern Indian poetry and prose; readings in translated or English works of representative authors.
141. (DH) RELIGION AND LITERATURE (3:3:0) Major religious themes as expressed in literary masterpieces; sacred texts from various cultures read as literature.
184. (DH) [ENGL 184 (DH)] THE SHORT STORY (3:3:0) Lectures, discussions, readings in translation, with emphasis on major writers of the nineteenth and twentieth centuries.

185. (DH) [ENGL 185 (DH)] THE MODERN NOVEL IN WORLD LITERATURE (3:3:0) Development of the modern novel in the last century (outside the British Isles and the United States); lectures, discussions, readings in translation.
189. (DH) [ENGL 189 (DH)] THE FOUNDERS OF MODERN DRAMA (3:3:0) Playwrights who set the world's stage for twentieth-century drama: Ibsen, Shaw, Chekhov, and Strindberg.

COMPUTER SCIENCE (CMPSC)

001. BASIC COMPUTER PROGRAMMING (1:0:2) Fundamental characteristics of digital computers; organization and coding of problems for solution on digital computer. Prerequisite: 2 entrance units in mathematics.
100. COMPUTER FUNDAMENTALS AND APPLICATIONS (3:3:0) Introduction to computer fundamentals and applications to data processing environments. Prerequisite: 2 entrance units in mathematics.
101. (GQ) INTRODUCTION TO ALGORITHMIC PROCESSES (3:3:0) Properties of algorithms, languages, and notations for describing algorithms; applications of a procedure-oriented language to problem solving. A student will receive credit for only one of the following courses: CMPSC 101, 103, 201, 203. Prerequisite: 2 entrance units in mathematics.
102. COMPUTER ORGANIZATION AND PROGRAMMING (3:3:0) Computer components and organization, representation of numbers and characters, instruction codes, machine language, programming, assembly systems, input-output, subroutines, and macros. Prerequisite: CMPSC 101.
103. (GQ) INTRODUCTION TO PROGRAMMING TECHNIQUES (4:3:2) Design and implementation of algorithms; structured programming; problem-solving techniques; introduction to a high-level, block-structured language, including arrays, procedures, parameters, recursion. A student will receive credit for only one of the following courses: CMPSC 101, 103, 201, 203. Prerequisite: 2 entrance units in mathematics.
120. INTERMEDIATE PROGRAMMING (4:3:2) Systematic programming: top-down program development, documentation, and testing. Introduction to data structures, text processing, numerical methods, algorithm analysis, program verification. Prerequisites: CMPSC 101 or 201; MATH 140.
140. INTRODUCTION TO DATA PROCESSING (3:3:0) Applications of digital computers to problems in data processing with examples from accounting, record updating, inventory control, and report generation. Prerequisite: CMPSC 101.
142. PROGRAMMING SYSTEMS FOR SMALL BUSINESS (3:3:0) Business applications programming and systems design applicable to the small business environment. Prerequisite: CMPSC 140.
144. DATA ORGANIZATION AND ACCESSING TECHNIQUES (4:3:2) Design characteristics of external storage devices; record organizations; accessing considerations for sequential, direct, relative, and indexed files; internal data structures. Prerequisites: CMPSC 102, 140.
154. ADVANCED ASSEMBLER, I/O TECHNIQUES, AND JOB CONTROL LANGUAGES (3:3:1) Macro-expansion; assembler-level I/O control; COBOL-assembler linkage conventions; advanced debugging techniques; assembler design; op-system features and JCL techniques. Students may not take both CMPSC 154 and 442 for credit. Prerequisite: CMPSC 144.
164. CONTEMPORARY TRENDS IN COMPUTER PROGRAMMING (3:3:0) State of the technology in design, code, test, and documentation techniques for information processing systems and large EDP production programs. Students may not take both CMPSC 164 and 444 for credit. Prerequisite: CMPSC 154.
174. ANALYSIS AND DESIGN OF INFORMATION SYSTEMS (2:1:2) The organization, flow charting, programming, debugging, and documentation of a major applied problem in a field of computer application. Prerequisite: third-semester standing.
175. IMPLEMENTATION OF INFORMATION SYSTEMS (1:0:2) Implementation and evaluation of an information system as designed in CMPSC 174 with peer review of the design. Prerequisite: CMPSC 174.
201. (GQ) COMPUTER PROGRAMMING FOR ENGINEERS (3:3:0) Development and implementation of algorithms in a procedure-oriented language, with emphasis on numerical methods for engineering problems. A student may receive credit for only one of the following: CMPSC 101, 103, 201, 203. Prerequisite: MATH 141.
203. (GQ) PRINCIPLES OF PROGRAMMING WITH BUSINESS APPLICATIONS (3:2:2) Programming in a high-level language. Introduction to networks, data communications, database terminology. Packaged software: statistical, spread-sheet, word/text processing. Designed for business students. A student may receive credit for only one of the following: CMPSC 101, 103, 201, 203. Prerequisite: 2 entrance units in mathematics.
211. INTRODUCTION TO SYSTEMS PROGRAMMING (3:2:2) Review of computer architecture concepts; assembly language programming, I/O routines, linkage and loading; microprocessor and large computer assembly languages. Prerequisite: CMPSC 120.

CURRICULUM AND INSTRUCTION (C I)

295. INTRODUCTORY FIELD EXPERIENCE FOR TEACHER PREPARATION (2–3 per semester, maximum of 6) Selected observation of schooling situations with small group and tutorial participation. Prerequisite: second-semester standing. Concurrent: EDTHP 115 and/or EDPSY 014.

DIETETIC FOOD SYSTEMS MANAGEMENT (D S M)

100. THE PROFESSION OF DIETETICS (1:1:0) Introduction to the profession and exploration of the roles and responsibilities of dietetic professionals.
101. SANITATION PRACTICES IN FOOD SERVICE OPERATIONS (3:3:0) Practical applications related to the management of the sanitation subsystem within a food service operation. This course will not meet the prescribed requirements for the HR&IM major in any option.
103. FOOD SERVICE MANAGEMENT: THEORY AND PRACTICE (3:3:0) Professional functions of the food service system, relationships with the nutrition component of food service systems.
195. FIELD EXPERIENCE IN COMMUNITY DIETETICS (2:1:2) Planning, preparation, and field experiences in community dietetic programs. Prerequisites: D S M 103, NUTR 801.
205. HUMAN RESOURCE MANAGEMENT IN FOOD SERVICE OPERATIONS (3:3:0) Theories and principles of supervision and training of food service employees for overall operational effectiveness.
250. QUANTITY FOOD PRODUCTION MANAGEMENT (4:3:1) Systems approach to managing quantity food production functions in health care settings; included are quantity food production principles and standards.
260. MANAGEMENT OF FOOD SERVICE OPERATING SYSTEMS (4:3:1) Major principles related to managing the purchasing, food, and labor subsystems of a health care food service system. Prerequisite: D S M 250.
270. QUALITY ASSURANCE FOR DIETETIC MANAGEMENT (3:2:2) Theories, principles, and methods of managing quality dietetic services. Prerequisites: D S M 103, NUTR 252.
295. PROFESSIONAL STAFF FIELD EXPERIENCE (4:3:1) Methods of, and practice in, the client-oriented dietetic systems in health care facilities. Prerequisites: D S M 260, 304.
304. MARKETING OF FOOD SERVICES IN HEALTH CARE FACILITIES (3:3:0) Theories and applications of marketing principles to the design of consumer-oriented dietetic services.

EARTH SCIENCE (EARTH)

001. EARTH SCIENCE (3:3:0) Integrated approach to fundamental problems in the earth sciences. Fields of study include geological sciences, physical geography, and meteorology. No credit will be given for this course if a student takes GEOG 019, GEOSC 020, or METEO 002.
002. (GN) GAIA—THE EARTH SYSTEM (3:3:0) An interdisciplinary introduction to the processes, interactions, and evolution of the Earth's biosphere, geosphere, and hydrosphere.

ECONOMICS (ECON)

002. (GS) INTRODUCTORY MICROECONOMIC ANALYSIS AND POLICY (3:3:0) Methods of economic analysis and their use; economic aggregates; price determination; theory of the firm; distribution.
004. (GS) INTRODUCTORY MACROECONOMIC ANALYSIS AND POLICY (3:3:0) National income measurement; aggregate economic models; money and income; policy problems.
014. (GS) PRINCIPLES OF ECONOMICS (3:3:0) Analysis of the American economy, emphasizing the nature and interrelationships of such groups as consumers, business, governments, labor, and financial institutions. Students who have passed ECON 002 (GS) or 004 (GS) or are registered in the College of Business Administration may not schedule this course.
302. (DS) INTERMEDIATE MICROECONOMIC ANALYSIS (3:3:0) Allocation of resources and distribution of income within various market structures, with emphasis on analytical tools. Prerequisite: ECON 002.
304. (DS) INTERMEDIATE MACROECONOMIC ANALYSIS (3:3:0) Analysis of forces that determine the level of aggregate economic activity. Prerequisite: ECON 004 (GS).
315. (DS) LABOR ECONOMICS (3:3:0) Economic analysis of employment, earnings, and the labor market; labor relations; related government policies. Prerequisite: ECON 002 (GS).
323. (DS) PUBLIC FINANCE (3:3:0) Contemporary fiscal institutions in the United States; public expenditures; public revenues; incidence of major tax types; intergovernmental fiscal relations; public credit. Prerequisite: ECON 002 (GS).

333. (DS) INTERNATIONAL ECONOMICS (3:3:0) Why nations trade, barriers to trade, balance of payments, adjustment and exchange rate determination, Eurocurrency markets, and trade-related institutions. Prerequisite: ECON 002 (GS) or 004 (GS) or 014 (GS).
336. (DS) ECONOMICS OF DISCRIMINATION (3:3:0) Examination of the economic positions of women and minorities, with analysis of race and sex discrimination and related government policies. Prerequisite: ECON 002 (GS).
342. (DS) INDUSTRIAL ORGANIZATION (3:3:0) Industrial concentration, size and efficiency of business firms, market structure and performance, competitive behavior, public policy. Prerequisite: ECON 002 (GS).
370. (DS) COMPARATIVE ECONOMIC SYSTEMS (3:3:0) Capitalism, socialism, communism, and fascism; examination of resource allocation, consumption, pricing, production, investment, income distribution, central planning. Prerequisites: ECON 002 (GS) or 014 (GS); 3 additional credits in social science.
372. (DS) SOVIET AND OTHER CENTRALLY PLANNED ECONOMIES (3:3:0) Comparative analysis of resource allocation principles, planning methodologies, investment, industry, agriculture, domestic and foreign trade in centrally planned economies. Prerequisites: ECON 002 (GS) or 014 (GS); 3 credits in related social science.

EDUCATIONAL PSYCHOLOGY (EDPSY)

014. LEARNING AND INSTRUCTION (3:3:0) Psychology of human learning applied toward the achievement of educational goals; evaluation of learning outcomes.
101. (GQ) ANALYSIS AND INTERPRETATION OF STATISTICAL DATA IN EDUCATION (3:3:0) An introduction to quantitative methods in educational research emphasizing the interpretation of frequently encountered statistical procedures.
297. SPECIAL TOPICS (1-9)

EDUCATIONAL THEORY AND POLICY (EDTHP)

115. EDUCATION IN AMERICAN SOCIETY (3:3:0) Introduction to the development of educational institutions, with emphasis on historical, philosophical, and sociological forces.

ELECTRICAL ENGINEERING TECHNOLOGY (EE T)

100. APPLIED ELECTRICITY (3:2:2) AC and DC circuits; machinery; controls; and introduction to electronic devices, circuits, and instrumentation. Prerequisites: MATH 087, PHYS 151.
101. FUNDAMENTALS OF ELECTRICAL CIRCUITS (3:3:0) Fundamental theory of resistance, current, voltage. Direct-current concepts from simple series circuits through Thevenin's theorem. Prerequisite or concurrent: MATH 087.
109. ELECTRICAL CIRCUITS LABORATORY (1:0:2) Introduction to electrical apparatus, including instruments, their interconnection into basic circuits, observation of circuit behavior, and report writing. Concurrent: EE T 101.
114. ELECTRICAL CIRCUITS (3:3:0) Direct-current circuit analysis; introduction to basic magnetism and magnetic circuits; single-phase circuit fundamentals. Prerequisites: EE T 101, MATH 087.
117. DIGITAL ELECTRONICS (3:3:0) Fundamentals of digital circuits, including logic circuits, boolean algebra, Karnaugh maps, counters, and registers. Prerequisite: EE T 101.
118. ELECTRICAL CIRCUITS LABORATORY (1:0:2) Laboratory study of direct-current networks and alternating-current circuits. Prerequisite: EE T 109. Concurrent: EE T 114.
120. DIGITAL ELECTRONICS LABORATORY (1:0:2) Laboratory study of solid state pulse, digital, industrial, and motor control circuits. Prerequisite: EE T 205. Concurrent: EE T 117.
204. A.C. CIRCUITS (2:2:0) Application of network theorems, laws, and methods to alternating-current circuits; balanced and unbalanced polyphase systems. Prerequisite: EE T 114.
205. SEMICONDUCTOR LABORATORY (1:0:2) Laboratory study of semiconductors. Assembly and tracing of electronic circuits. Concurrent: EE T 210.
206. A.C. CIRCUITRY LABORATORY (1:0:2) Laboratory study of alternating-current circuits; assembly and tracing of electrical circuits. Concurrent: EE T 204.
210. FUNDAMENTALS OF SEMICONDUCTORS (3:3:0) Semiconductor physics and circuit theory including hybrid parameters; equivalent circuits; power amplifiers and frequency response of small signal amplifiers. Prerequisite or concurrent: EE T 114, MATH 088.

ENGINEERING

211. MICROPROCESSORS (4:3:2) A study of machine language programming, architecture, and interfacing for microprocessor-based systems emphasizing engineering applications and microcomputers. Prerequisite: EE T 117.
213. FUNDAMENTALS OF ELECTRICAL MACHINES (3:2:2) Direct-current machinery principles and applications; introduction to machines and basic concepts of laboratory methods related to machinery studies. Prerequisites: EE T 114, 118.
215. A.C. MACHINERY AND CONTROL (3:3:0) Alternating-current machinery principles and applications; survey of alternating- and direct-current machinery control methods. Prerequisites: EE T 204, 213.
216. LINEAR ELECTRONIC CIRCUITS (3:3:0) Theoretical study of linear electronic devices and circuits, including field effect transistors, integrated circuits, and operational amplifiers. Prerequisite: EE T 210.
219. A.C. MACHINERY LABORATORY (1:0:2) Alternators, induction generators, single- and polyphase motors, synchro units, transformers, saturable reactors, and protective devices. Prerequisite: EE T 206. Concurrent: EE T 215.
221. LINEAR ELECTRONICS LABORATORY (1:0:2) Laboratory study of transistors; study of differential and operational amplifiers. Emphasis is placed on circuit design. Prerequisite: EE T 205. Concurrent: EE T 216.
297. SPECIAL TOPICS (1–9)

ENGINEERING (ENGR)

002. ENGINEERING ORIENTATION (1:0:2) Introduction to efficient methods for analyzing and solving engineering problems.
005. EXPERIMENTAL METHODS FOR ENGINEERS (1:0:2) Introduction to experimental methods used in engineering. Applications of basic experimental and computational concepts through student involvement in laboratory experiments.

ENGINEERING GRAPHICS (E G)

001. ENGINEERING GRAPHICS (2:1:3) Technical skills and drafting room practices; fundamentals of theoretical graphics; orthogonal, oblique, and perspective projections; working and schematic drawings.
003. ARCHITECTURAL GRAPHICS (2:0:6) Principles of architectural drawing; spatial relationships of points, lines, planes, and solids, with architectural applications; shadows, perspective.
010. INTRODUCTORY ENGINEERING GRAPHICS (1:0:3) Multiview projections, pictorial drawings, dimensioning, engineering standards, and working drawings.
011. ENGINEERING DESIGN GRAPHICS (1:0:3) Introduction to creative design, space analysis, graphs, graphical mathematics, vector analysis, and design implementation. Prerequisite: E G 010 or 021.
021. ENGINEERING GRAPHICS FOR MINING (2:0:6) Drafting techniques, multiview systems, reproductions, pictorials, auxiliaries, sections, space geometry, vectors, with emphasis on inking procedures and skills.
050. ENGINEERING METHODS AND GRAPHICAL COMMUNICATION (3:1:5) Introduction to engineering through graphics (multiviews, pictorials, dimensioning, space analysis); microcomputer literacy in BASIC, with computer graphics and instrumentation laboratory.

ENGINEERING GRAPHICS TECHNOLOGY (EG T)

101. TECHNICAL DRAWING FUNDAMENTALS (1:0:2) Technical skills and drafting room practices; fundamentals of theoretical graphics; orthographic projection including sectional and auxiliary views; dimensioning.
102. INTRODUCTION TO COMPUTER-AIDED DRAFTING (1:0:2) A first course presenting an intensive study utilizing a computer-assisted drafting and design system to obtain graphic solutions.
103. SPATIAL ANALYSIS (2:1:2) Spatial relations of points, lines, and solids with applications in engineering technology. Prerequisite: EG T 101.
104. COMPUTER-AIDED DRAFTING (1:0:2) A second course on the more advanced functionality of computer-aided drafting and design systems. Prerequisite: EG T 102.
201. ADVANCED COMPUTER-AIDED DRAFTING (2:1:2) Application of principles of engineering graphics; preparation of working drawings; details, examples, and bill of material using CAD. Prerequisite: EG T 101 or 102.
297. SPECIAL TOPICS (1–9)

ENGLISH (ENGL)

001. (GH) UNDERSTANDING LITERATURE (3:3:0) Explores how major fiction, drama, and poetry, past and present, primarily English and American, clarify enduring human values and issues.
002. (GH) THE GREAT TRADITIONS IN ENGLISH LITERATURE (3:3:0) Major works of fiction, drama, and poetry from the Middle Ages to the twentieth century expressing enduring issues and values.
003. (GH) THE GREAT TRADITIONS IN AMERICAN LITERATURE (3:3:0) Major works of fiction, drama, and poetry from the colonial to the modern periods expressing enduring issues and values.
004. BASIC WRITING SKILLS (3:3:0 per semester, maximum of 6) Intensive practice in writing sentences and paragraphs, and instruction in grammar, usage, and punctuation. Designed for students with deficient preparation. *This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program.*
005. WRITING TUTORIAL (1:0:2) Tutorial instruction in composition and rhetoric for students currently enrolled in ENGL 004 or 015. *This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program.*
015. (GWS) RHETORIC AND COMPOSITION (3:3:0) Instruction and practice in writing expository prose that shows sensitivity to audience and purpose. Prerequisite: ENGL 004 or satisfactory performance on the English proficiency examination.
030. (GWS) HONORS FRESHMAN COMPOSITION (3:3:0) Writing practice for especially qualified and screened students. Students who have passed a special writing test will qualify for this course.
050. (DA) INTRODUCTION TO CREATIVE WRITING (3:3:0) Practice and criticism in the reading, analysis, and composition of fiction, nonfiction, and poetry writing.
104. (DH) THE BIBLE AS LITERATURE (3:3:0) Study of the English Bible as a literary and cultural document.
129. (DH) SHAKESPEARE (3:3:0) A selection of the major plays studied to determine the sources of their permanent appeal. Intended for nonmajors.
133. (DH) MODERN AMERICAN LITERATURE TO WORLD WAR II (3:3:0) Eliot, Frost, Faulkner, Fitzgerald, Hemingway, O'Neill, and other writers representative of the years between the world wars.
134. (DH) AMERICAN COMEDY (3:3:0) Studies in American comedy and satire, including such writers as Mark Twain, Faulkner, Vonnegut, and Heller.
139. (DH) BLACK AMERICAN LITERATURE (3:3:0) Fiction, poetry, and drama, including such writers as Baldwin, Douglass, Ellison, Morrison, and Wright.
140. (DH) CONTEMPORARY LITERATURE (3:3:0) Writers such as Barth, Beckett, Bellow, Ellison, Lowell, Mailer, Pinter, Plath, and Vonnegut.
165. (DH) GREAT ENGLISH NOVELS (3:3:0) Introduction to selected major novels by such writers as Defoe, Fielding, Austen, Brontë, Dickens, Hardy, Conrad, Joyce, Lawrence, and Woolf.
167. (DH) POETRY (3:3:0) Introduction to the appreciation and analysis of English and American poetry.
168. (DH) DRAMA (3:3:0) Introduction to the range of dramatic expression in selected plays, primarily English and American.
184. (DH) [C LIT 184 (DH)] THE SHORT STORY (3:3:0) Lectures, discussions, readings in translation, with primary emphasis on major writers of the nineteenth and twentieth centuries.
185. (DH) [C LIT 185 (DH)] THE MODERN NOVEL IN WORLD LITERATURE (3:3:0) Development of the modern novel in the last century (outside the British Isles and the United States); lectures, discussions, readings in translation.
189. (DH) [C LIT 189 (DH)] THE FOUNDERS OF MODERN DRAMA (3:3:0) Playwrights who set the world's stage for twentieth-century drama: Ibsen, Shaw, Chekhov, and Strindberg.
191. SCIENCE FICTION (3:3:0) Science fiction as the literature of technological innovation and social change—its development, themes, and problems.
192. THE LITERATURE OF FANTASY (3:3:0) Major realms of fantasy in English and American literature: daydream and nightmare, the pastoral, dystopia, utopia, apocalypse, and the heroic.
194. (DH) WOMEN WRITERS (3:3:0) Short stories, novels, poetry, drama, and essays by major English and American women writers since 1870.
196. (AM ST 196) INTRODUCTION TO AMERICAN FOLKLORE (3:3:0) A basic introduction to verbal and nonverbal folklore, stressing the basic procedures of collection, classification, and analysis.
197. (AM ST 197) AMERICAN FOLK SONG IN ENGLISH (3:3:0) British songs in America; native repertoires, white and black; folk ballad; and musical development.
- 202A. (GWS) EFFECTIVE WRITING: WRITING IN THE SOCIAL SCIENCES (3:3:0) Instruction in writing persuasive arguments about significant issues in the social sciences. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 or 030; fourth-semester standing.
- 202B. (GWS) EFFECTIVE WRITING: WRITING IN THE HUMANITIES (3:3:0) Instruction in writing persuasive arguments about significant issues in the humanities. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 or 030; fourth-semester standing.

ENTOMOLOGY

202C. (GWS) EFFECTIVE WRITING: TECHNICAL WRITING (3:3:0) Writing for students in scientific and technical disciplines. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 or 030; fourth-semester standing.

202D. (GWS) EFFECTIVE WRITING: BUSINESS WRITING (3:3:0) Writing reports and other common forms of business communication. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 or 030; fourth-semester standing.

297. SPECIAL TOPICS (1-9)

ENTOMOLOGY (ENT)

012. BIOLOGY AND MANAGEMENT OF PLANT PESTS (3:2:2) Basic and practical information on the identification, habits, and control of important insect pests of plants and plant products.

FINANCE (FIN)

100. INTRODUCTION TO FINANCE (3:3:0) The nature, scope, and interdependence of the institutional and individual participants in the financial system. A student may not receive credit toward graduation for both FIN 100 and FIN 301. Prerequisite: third-semester standing.

108. PERSONAL FINANCE (3:3:0) Personal management of budgets, bank accounts, loans, credit buying, insurance, real estate, and security buying. May not be scheduled by College of Business Administration students. Prerequisite: third-semester standing.

297. SPECIAL TOPICS (1-9)

301. CORPORATION FINANCE (3:3:0) The acquisition and management of corporate capital; analysis of operations, forecasting capital requirements, raising capital, and planning profits. Prerequisites: ACCTG 101; ECON 002, 004; MATH 110; Q B A 101.

FOOD SCIENCE (FD SC)

105. (GHS) [S T S 105 (GHS)] FOOD FACTS AND FADS (3:3:0) Impact on society and the individual of modern food technology, food laws, additives, etc; historical, current, and futuristic aspects.

FORESTRY (FOR)

105. FOREST MENSURATION (3:2:3) Measurement of forests and forest products.

106. FOREST INVENTORIES (3:2:4) Application of land surveying and sampling techniques, including statistical analysis, for the determination of timber volume and growth.

108. FIELD STUDIES IN ECOLOGY (1) Field studies in ecological problems, challenges, and impacts related to normal forest practices in general resource management. Prerequisite: FOR 826.

137. INTRODUCTION TO HARVESTING (1:0:4) Field application of harvesting techniques, including sale layout and operation of hand and power equipment.

138. INTERMEDIATE OPERATIONS (1:0:4) Field practicum in planting, pruning, and thinning of forest stands. Prerequisite: FOR 137.

140. LETTERING AND DRAFTING (2:0:4) Freehand, mechanical, transfer lettering skills and drafting room practices.

141. FOREST SURVEYING (4:2:8) Plane surveying and mapping techniques as applied to forestry practices. Prerequisite or concurrent: FOR 140, MATH 087.

220. FOREST ECOSYSTEM PROTECTION (3:3:0) Principles and concepts involved in managing the forest ecosystem in regard to fires, insects, and diseases.

221. FOREST FIRE TECHNOLOGY (1:0:3) Technological aspects of controlling and using fire in the forest environment. Prerequisite: FOR 220.

234. RECLAMATION MANAGEMENT (3:2:3) Consideration of various factors of soils, hydrology, and reclamation in the reclaiming and revegetation of disturbed sites. Prerequisite: FOR 141 or 366 or C E 114 or 210.

240. **SILVICULTURAL PRACTICES (3:2:3)** Principles and techniques of forest establishment, culture, regeneration, and harvesting. Prerequisite: FOR 203 or 250.
241. **AERIAL PHOTO INTERPRETATION (4:2:6)** Aerial photo interpretation techniques applied to land management inventories, mapping, road location, and procurement. Prerequisites: FOR 203; FOR 105 and 106, or FOR 366.
242. **ELEMENTS OF PROJECT SUPERVISION IN FORESTRY (3:3:0)** Supervisory techniques developed through an understanding of the behavioral sciences applied to field forestry personnel management.
245. **MICROCOMPUTERS IN FORESTRY (2:1:2)** Computer literacy; elementary programming in basic and software applications in forestry. Prerequisite: FOR 850 or 3 credits in mathematics.
250. **DENDROLOGY (3:0:6)** Taxonomy, identification, ranges, and uses of important U.S. timber species and lesser vegetation of a regional nature.
807. **FOREST RECREATION (3:2:3)** Development, construction, and management of forest recreation areas and facilities. Prerequisite: FOR 141.
808. **FOREST PROTECTION (3:2:3)** Forest fire prevention, detection, behavior, and suppression; fire plans and statistics; insect and disease control.
814. **FORESTRY LEADERSHIP PRACTICUM (1:0:3)** Leadership techniques applied to standard forestry field operations. Prerequisite: FOR 242.
817. **URBAN FORESTRY (3:2:3)** The application of land treatment techniques and forestry practices to urban environments. Prerequisite: FOR 807.
818. **INDIVIDUAL STUDIES (1–3 per semester)** Individual study of forest technology.
820. **ADVANCED FOREST MEASUREMENTS (1)** Application of point and 3P sampling methods as a means of developing the database for integrated forest management planning. Prerequisites: FOR 809, 826.
822. **FOREST MANAGEMENT SYSTEMS (2)** Field projects and an extended field tour dealing with silvicultural, mensurational, and regulation techniques of forest management planning. Prerequisite: FOR 240.
825. **HARVESTING TECHNIQUES (1:0:3)** Practical instruction in the operation of heavy equipment used in timber harvesting. Prerequisite: FOR 137.
826. **REFORESTATION AND INTERMEDIATE OPERATIONS (1:0:3)** Field practicum in planting, pruning, thinning forest stands. Prerequisite: FOR 825.
827. **FIELD STUDY PREPARATION (1)** Developing practices, procedures, and materials for conducting integrative field studies. Prerequisite: FOR 241.
828. **SAWMILL ORIENTATION (1:1:0)** An overview of sawmill industry equipment, processes, and products.
829. **SAWMILL BUSINESS MANAGEMENT (3:2:3)** Fundamental business practices applied to a small sawmill business enterprise. Prerequisite: FOR 828.
830. **SAWMILL OPERATION (3:2:3)** Technical and applied aspects of sawmilling. Prerequisite: FOR 828.
831. **SAWMILL OPERATION PRACTICUM (4)** Extended hands-on experience to develop operational competencies in running a small sawmill. Prerequisite: FOR 830.
850. **FORESTRY QUANTIFICATION (4:4:0)** Principles of quantification applied to natural resources management and surveying.
860. **FOREST VALUATION (1)** Gathering and analyzing cost and production data related to stumpage valuation and equipment management. Prerequisite: FOR 106.

FRENCH (FR)

001. **ELEMENTARY FRENCH I (4:4:0)** Grammar, with reading and writing of simple French; oral and aural work stressed. Students who have received high school credit for two or more years of French may not schedule this course for credit without permission of the department.
002. **ELEMENTARY FRENCH II (4:4:0)** Grammar and reading continued; oral and aural phases progressively increased. Students who have received high school credit for four years of French may not schedule this course for credit without permission of the department. Prerequisite: FR 001.
003. **INTERMEDIATE FRENCH (4:4:0)** Grammar, reading, composition, oral and aural exercises. Prerequisite: FR 002.
139. (GH) **FRANCE AND THE FRENCH-SPEAKING WORLD (3:3:0)** An introduction to the culture of France and its impact on the world.
140. **FRENCH NOVEL IN ENGLISH TRANSLATION (1–6)** Readings of selected French masterpieces in translation; discussion of recurring themes in several literary periods.
142. (GH) **FRENCH LITERATURE IN TRANSLATION (3:3:0)** An introduction to the literature of France and French-speaking countries.

GEOGRAPHY (GEOG)

010. (GN) PHYSICAL GEOGRAPHY: AN INTRODUCTION (3:2:2) Survey and synthesis of processes creating geographical patterns of natural resources, with application of basic environmental processes in resource management.
020. (GS) HUMAN GEOGRAPHY: AN INTRODUCTION (3:3:0) Spatial perspective on human societies in a modernizing world; regional examples; use of space and environmental resources; elements of geographic planning.
100. (DS) ECONOMIC GEOGRAPHY (3:3:0) The location of economic activity at both macro- and micro-regional levels on the Earth's surface.
- 102W. (DH) THE AMERICAN SCENE (3:3:0) How Americans converted wilderness into domesticated landscapes, and how the American scene visibly reflects national and regional cultures.
103. (DS) GEOGRAPHY OF DEVELOPING WORLD (3:3:0) Patterns of poverty in poor countries; conventional and nonconventional explanations; focus on solutions; case studies of specific regions.
110. (DN) CLIMATES OF THE WORLD (3:2:2) Introduction to climatology, including principal processes of the global climatic system and their variation over space and time.
115. (DN) LANDFORMS OF THE WORLD (3:2:2) Distribution of the world's landform features and mineral resources; their characteristics, causes, and significance. Practicum includes correlated field trips and laboratory studies.
120. (DS) URBAN GEOGRAPHY (3:3:0) Urban growth and stagnation; location of cities and urban systems; intraurban spatial structure; contemporary American urban problems.
124. (DS) ELEMENTS OF CULTURAL GEOGRAPHY (3:3:0) Locational analysis of changes in non-Western cultures. Problems of plural societies, economic development, population growth, and settlement.
128. (DS) GEOGRAPHY OF INTERNATIONAL AFFAIRS (3:3:0) Contemporary international affairs in their geographical setting; geographic elements in the development of national power, political groupings, and international disputes.

GEOSCIENCES (GEOSC)

- * 001. PHYSICAL GEOLOGY (3:2:3) Earth processes and their effects on the materials, structure, and morphology of the Earth's crust. Practicum includes field work, study of rocks, minerals, dynamic models, and topographic maps.
- * 020. (GN) PLANET EARTH (3:2:2) Nontechnical presentation of Earth processes, materials, and landscape. Practicum includes field trips, study of maps, rocks, and dynamic models, introduction to geologic experimentation.
- * 021. EARTH HISTORY (3:2:2) Evolution of the Earth; changing patterns of mountains, lowlands, and seas; development of living organisms. Practicum includes field trips, studies of geologic maps, geologic problems, fossils.
040. (GN) THE SEA AROUND US (3:2:2) Introduction to marine science, including physical, chemical, biological, and geological aspects of oceanography; the sea as a multipurpose natural resource.

GERMAN (GER)

001. ELEMENTARY GERMAN I (4:3:2) Listening, speaking, reading, writing; introduction to basic structures and vocabulary through dialogues and literary and cultural readings. Students may receive credit for only one of the following: GER 001, 011, or 015. Students who have received high school credit for two or more years of German may not schedule this course for credit without permission of the department.
002. ELEMENTARY GERMAN II (4:3:2) Listening, speaking, reading, writing; introduction to basic structures and vocabulary through dialogues and literary and cultural readings. Students may receive credit for only one of the following: GER 002, 012, or 016. Students who have received high school credit for four years of German may not schedule this course for credit without permission of the department. Prerequisite: GER 001.
003. INTERMEDIATE GERMAN (4:3:2) Continued skill development; readings consisting of short literary and journalistic writings; increased attention to German cultural context. Students may receive credit for only one of the following: GER 003, 012, or 016. Prerequisite: GER 002.
011. INTENSIVE BASIC GERMAN (6:5:2) Listening, speaking, reading, writing basic structures and vocabulary of German. Taught on an accelerated basis. Students may receive credit for only one of the following: GER 001, 011, or 015.

*This course includes from one to several field trips for which an additional charge will be made to cover transportation.

012. INTENSIVE INTERMEDIATE GERMAN (6:5:2) Continued skill development of structures and vocabulary; listening, speaking, reading, writing. Taught on an accelerated basis. Students may receive credit for only one of the following: GER 002, 003, 012, or 016. Prerequisite: GER 011.
015. READING GERMAN I (3:3:0) Survey of German grammar, with readings in technical prose, for students whose programs permit only two semesters of foreign language. Students may receive credit for only one of the following: GER 001, 011, or 015.
016. READING GERMAN II (3:3:0) Continuation of GER 015, with readings in the student's own field. Students may receive credit for only one of the following: GER 002, 012, or 016. Prerequisite: GER 015.
100. (GH) GERMAN CULTURE AND CIVILIZATION (3:3:0) Life of the German people from the early Middle Ages to modern times; their literature and arts, music, science, and philosophy. Conducted in English.
120. (DH) THE FAUST THEME IN LITERATURE AND IN OTHER ARTS (3:3:0) Survey of the Faust theme in literature (Spiess, Marlowe, Goethe, Mann), book illustrations, music (Gounod), theatre, film, and visual arts. Conducted in English.
150. (GH) MASTERPIECES OF GERMAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Major works and prominent authors, e.g., *Nibelungenlied*, *Tristan*, Lessing, Goethe, Schiller, Heine, Hauptmann, Hesse, Mann, Kafka, Böll, Grass, Frisch.
157. (DH) PENNSYLVANIA GERMAN LANGUAGE AND CULTURE (3:3:0) Survey of the background, customs, literature, religion, folklore, folk art, music, and education of the Pennsylvania Germans. Conducted in English.
180. (DH) GOETHE AND HIS CONTEMPORARIES IN ENGLISH TRANSLATION (3:3:0) Major works of Goethe and his contemporaries, especially Schiller, in translation.
190. (DH) TWENTIETH-CENTURY GERMAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Works of such writers as Brecht, Dürrenmatt, Grass, Hesse, Kafka, Mann, Rilke, and Weiss.
195. (DH) MODERN GERMAN DRAMA AND THEATRE (3:3:0) Plays and their stage realization by writers such as Hauptmann, Schnitzler, Wedekind, Kaiser, Brecht, Dürrenmatt, Weiss, Handke, and Fassbinder. Conducted in English.
200. (DH) CULTURE IN EAST AND WEST GERMANY (3:3:0) Major currents and forces present in contemporary German intellectual, educational, social, economic, and political life within the international context. Conducted in English.

GREEK (GREEK)

001. ELEMENTARY CLASSICAL AND NEW TESTAMENT GREEK (4:3:2) Pronunciation, forms, syntax, and translation.
002. ELEMENTARY CLASSICAL AND NEW TESTAMENT GREEK (4:3:2) Further instruction in syntax and sentence structure. Prerequisite: GREEK 001.
003. INTERMEDIATE CLASSICAL AND NEW TESTAMENT GREEK (4:3:2) Selections from representative authors. Prerequisite: GREEK 002.
187. GREEK FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a Liberal Arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
297. SPECIAL TOPICS (1-9)

HEALTH EDUCATION (HL ED)

003. (GHS) DRUGS IN SPORTS (1:1:0) Nature of drug use, misuse, and abuse in the athletic setting with implications for counseling and controls.
005. (GHS) HEALTH ASPECTS OF SPORT (1:1:0) Basic principles and concepts of safety, health, and fitness for recreation and sport.
013. (GHS) STANDARD FIRST AID, PERSONAL SAFETY, AND CPR (1:1:1) Theoretical and technical aspects of standard first aid, personal safety, and cardiopulmonary resuscitation (CPR).
015. (GHS) LIFE-STYLE FOR BETTER HEALTH (1:1:0) Concepts of health, life-style, and risk factors; development and implementation of personal action plans.
019. (GHS) HEALTH AND DISEASE (1:1:0) Essentials of communicable and chronic disease control.
043. (GHS) DRUGS IN SOCIETY (1:1:0) An exploration of the health-related aspects of drug use and abuse.
044. (GHS) INTRODUCTION TO DEATH EDUCATION (1:1:0) Educational and consumer aspects of dying and death from a health education perspective.
045. (GHS) ALCOHOL AWARENESS EDUCATION (1:1:0) A course designed to raise awareness relative to the use and abuse of beverage alcohol.

HEALTH POLICY AND ADMINISTRATION

046. (GHS) INTRODUCTION TO HEALTH ASPECTS OF HUMAN SEXUALITY (1:1:0) An examination of health concerns related to sexuality and sexual behavior.
048. (GHS) VALUES AND HEALTH BEHAVIOR (1:1:0) An exploration of opinions, beliefs, attitudes, and personal values as they relate to decision making and health behavior.
057. (GHS) CONSUMER HEALTH (1:1:0) Essentials for determining credibility of claims for particular health services and products from a consumer's perspective.
060. (GHS) PRINCIPLES AND PRACTICES OF HEALTHFUL LIVING (3:3:0) Facts and principles as related and applied to the science of living serve as a basis for health instruction and student guidance.
303. (GHS) EMERGENCY CARE (3:2:2) Competencies leading toward certification in Advanced First Aid and Emergency Care and Cardiopulmonary Resuscitation.
384. APPLIED KINESIOLOGY (3:2:2) Study of anatomical structure, body movement. Characteristic muscle action and motion will be analyzed in relation to physical therapy context. Prerequisite: BIOL 029.
800. PHYSICAL THERAPIST ASSISTANT—INTRODUCTION (3:2:2) Orientation to the field of physical therapy, historical background of the profession, professional ethics, medical terminology, and patient transportation techniques.
801. PHYSICAL THERAPIST ASSISTANT—PROCEDURES (4:2:4) General considerations for physical therapy modalities; development of skills and their application; diagnostic testing.
802. CLINICAL NEUROSCIENCE (1:1:0) Anatomical and pathological basis of common conditions involving the nervous system, with emphasis on treatment and management techniques.
803. MEDICAL SURGICAL ORIENTATION TO THERAPY (3:3:0) Introduction to medical and postoperative conditions and/or disease states most frequently treated by physical therapy modalities.
804. THERAPEUTIC EXERCISE (3:2:2) Introduction to the principles of exercise in the treatment of disease and injury.
805. REHABILITATION (2:2:0) Examination of techniques and practical experience with appliances used in the rehabilitation of the physically disabled.
806. PHYSICAL THERAPIST ASSISTANT—PRACTICUM (12) The practice of physical therapist assistant skills in a clinical setting under the direct supervision of a registered physical therapist. Prerequisites: HL ED 801, 804, 805.
807. TECHNIQUES FOR EFFECTIVE PATIENT INTERACTION (1:1:0) Techniques of interacting with the sick or disabled patient; emphasis will be on enhancing interaction skills.
808. CLINICAL ORTHOPEDICS (1:1:0) Anatomical and pathological basis of common musculoskeletal conditions, with emphasis on current treatment techniques.

HEALTH POLICY AND ADMINISTRATION (H P A)

101. INTRODUCTION TO HEALTH SERVICES ORGANIZATION (3:3:0) Examination of social, political, economic, historic, and scientific factors in the development and organization of the medical care health services.
301. HEALTH SERVICES POLICY ISSUES (3:3:0) Analysis of major issues in health services delivery in hospitals, medical practice, public health, mental health, and health professional education. Prerequisites: HPA 101, PL SC 001, ECON 002.
310. HEALTH CARE AND MEDICAL NEEDS (3:3:0) Health care from an individual, family, and community standpoint illustrated with specific diseases and health problems. Prerequisite: 3 credits in biology.

HEBREW (HEBR)

001. BASIC MODERN HEBREW (4:3:2) An introduction to modern Hebrew in its written and spoken forms; oral and aural work stressed.
002. BASIC MODERN HEBREW (4:3:2) Continued study of grammar; emphasis on improving oral-aural facility, with increased attention to reading and writing. Prerequisite: HEBR 001.
003. INTERMEDIATE MODERN HEBREW (4:3:2) Grammar, reading, composition, and oral and aural exercises. Prerequisite: HEBR 002.
010. (GH) JEWISH CIVILIZATION (3:3:0) Life of the Jewish people from Biblical times, emphasizing cultural, religious, and institutional developments.
187. HEBREW FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a Liberal Arts education in the context of a specific discipline. Prerequisites: first-semester and enrollment in the College of the Liberal Arts.
295. INTERNSHIP (1-8)
296. INDEPENDENT STUDIES (1-18)
297. SPECIAL TOPICS (1-9)

HISTORY (HIST)

001. (GH) THE WESTERN HERITAGE I (3:3:0) A survey of the Western heritage from the ancient Mediterranean world to the dawn of modern Europe.
002. (GH) THE WESTERN HERITAGE II (3:3:0) A survey of the Western heritage from the dawn of modern Europe in the seventeenth century to the present.
003. (GH) THE AMERICAN NATION: HISTORICAL PERSPECTIVES (3:3:0) Central themes in American history from discovery and settlement to the present.
010. (GH) NON-WESTERN CIVILIZATIONS (3:3:0) Introduction to social, economic, and political evolution of non-Western cultures; responses to the West; modernization and development.
012. (DH) HISTORY OF PENNSYLVANIA (3:3:0) Chronological and topical survey, emphasizing immigration of diverse ethnic groups and religious, political, economic, and social developments, including industrialization and urbanization.
020. (DH) AMERICAN CIVILIZATION TO 1877 (3:3:0) A historical survey of the American experience from its colonial beginnings through the Civil War and Reconstruction.
021. (DH) AMERICAN CIVILIZATION SINCE 1877 (3:3:0) A historical survey of the American experience from the emergence of urban-industrial society in the late nineteenth century to the present.
100. (DH) ANCIENT GREECE (3:3:0) Greek world from the earliest Aegean cultures to the death of Alexander the Great and the beginnings of Hellenistic civilization.
101. (DH) THE ROMAN REPUBLIC AND EMPIRE (3:3:0) History of the Roman Republic and Empire from the origins of Rome to the disintegration of the Empire.
105. (DH) THE BYZANTINE EMPIRE (3:3:0) Development of Byzantine civilization from the decline of the Roman Empire to the fall of Constantinople.
107. (DH) [MEDVL 107 (DH)] MEDIEVAL EUROPE (3:3:0) Rise and development of the civilization of medieval Europe from the decline of Rome to 1500.
108. (DH) THE CRUSADES: HOLY WAR IN THE MIDDLE AGES (3:3:0) The social and political history of medieval religious warfare in Europe and the Middle East.
116. (DS) FAMILY AND SEX ROLES IN MODERN HISTORY (3:3:0) Historical perspectives on the Western family since 1500: gender roles, marriage, sexuality, child rearing, and old age; emphasis on United States.
117. (DH) WOMEN IN MODERN HISTORY (3:3:0) Modernization and women: changing images and roles since the mid-eighteenth century in the family, workshop, politics, society; cross-cultural comparisons.
120. (DS) EUROPE SINCE 1848 (3:3:0) Political, social, and ideological developments; origin and impact of two World Wars; totalitarianism and democracy; changing role in the world.
141. (DH) MEDIEVAL AND MODERN RUSSIA (3:3:0) Introductory survey, including political, social, economic, and cultural development of Kievan, Muscovite, and Imperial Russia.
142. (DS) HISTORY OF COMMUNISM (3:3:0) Marxism; Leninism and evolution of the Soviet Union; formation and development of the communist bloc; impact of Chinese Communism.
143. (DH) HISTORY OF FASCISM AND NAZISM (3:3:0) The study of right-wing totalitarianism in the twentieth century, with special emphasis on Fascist Italy and Nazi Germany.
144. THE WORLD AT WAR: 1939–1945 (3:3:0) In-depth study of the origins and conduct of World War II. Political and economic aspects as well as military.
150. COLONIAL PENNSYLVANIA (3:3:0) Development of the colony of Pennsylvania through the war for American independence, covering immigration, economics, politics, religion, and society.
151. (DS) TECHNOLOGY AND SOCIETY IN AMERICAN HISTORY (3:3:0) Development of technology in America from colonial times; its reception and its influence on social, economic, and political life.
152. (DH) THE AFRO-AMERICAN EXPERIENCE (3:3:0) African roots; colonial and revolutionary experiences; slavery and abolitionism; Civil War and reconstruction; accommodation and protest; the new militancy.
154. HISTORY OF WELFARE IN AMERICA (3:3:0) History of the care of dependent people (including children, the aged, mentally ill, unemployed) from colonial times to the present.
155. (DS) AMERICAN BUSINESS HISTORY (3:3:0) The development of business from the planting of the colonies, through the stages of industrialization, to the present.
156. (L I R 156) HISTORY OF THE AMERICAN WORKER (3:3:0) A study of the American worker from the preindustrial era to the present.
158. HISTORY OF AMERICAN IMMIGRATION (3:3:0) The waves of migration to America and an analysis of the resulting minority groups, their reception, assimilation, and persisting identity.
173. (DS) VIETNAM AT WAR (3:3:0) Rise of nationalism and communism: origins of conflict; United States involvement; impact on postwar regional and international politics; contemporary Vietnam.
174. (DH) THE HISTORY OF TRADITIONAL EAST ASIA (3:3:0) Comparative cultural, institutional, and social history of traditional China and Japan to their contact with the industrialized West.
175. (DH) THE HISTORY OF MODERN EAST ASIA (3:3:0) Comparative survey of the internal developments and external relations of China and Japan since their contact with the industrialized West.
178. (DH) LATIN-AMERICAN HISTORY TO 1820 (3:3:0) Conquest of the New World, development of colonial institutions, impact on native cultures, and origins of independence movements.

HOTEL, RESTAURANT, AND INSTITUTIONAL MANAGEMENT

179. (DH) LATIN-AMERICAN HISTORY SINCE 1820 (3:3:0) Origin, political growth, international relations, and economic status of the Latin-American republics, with emphasis upon present-day conditions.
181. (DH) INTRODUCTION TO THE MIDDLE EAST (3:2:2) Origins of Islamic civilization; expansion of Islam; the Ottoman Empire; the Middle East since 1918.
191. (DH) EMERGING AFRICA (3:3:0) Indigenous African societies; impact of Rome, Islam, and Europe; slave trade; colonialism; nationalism; problems since independence.
195. HISTORY OF CANADA (3:3:0) An integrated survey from French colonial beginnings to modern Dominion status, with special emphasis on relations with the United States.

HOTEL, RESTAURANT, AND INSTITUTIONAL MANAGEMENT (HR&I M)

201. INTRODUCTION TO MANAGEMENT IN THE HOSPITALITY INDUSTRY (2:2:0) Exploration and analysis of management opportunities, functions, methods, and concepts in various segments of the hospitality industry. Concurrent: HR&IM 202.
202. COLLOQUIUM IN HOSPITALITY MANAGEMENT (1–4) Major industry and professional speakers lecture on current issues followed by discussion with students and faculty. Prerequisite or concurrent: HR&IM 201.
204. HOTEL AND RESTAURANT MARKETING AND MERCHANDISING (3:3:0) Merchandising and marketing as a system concerned with motivating consumers to purchase hospitality products and services. This course will not meet the prescribed requirements for the HR&IM major in any option.
250. QUANTITY FOOD PRODUCTION ANALYSIS (4:3:2) Physical characteristics of principal food product groups considered. Topics include purchasing problems, preparation techniques, quality and cost control. This course will not meet the prescribed requirements for the HR&IM major in any option.
260. HOSPITALITY SUPERVISION SEMINAR (4) Hospitality management topics are discussed with a major emphasis on operations management. Prerequisites: H F S 204, HR&IM 301, 310, 381. This course will not meet the prescribed requirements for the HR&IM major in any option.
270. HOSPITALITY ADMINISTRATION SEMINAR (4) Components of food service systems are identified and studied as separate problems and as a total system. Prerequisite: HR&IM 260. This course will not meet the prescribed requirements for the HR&IM major in any option.
295. ANALYSIS OF FIELD EXPERIENCE I (2:2:0) Directed written and oral analysis of the 500-hour hospitality working experience focusing on the physical and social environment.
301. INTRODUCTION TO THE MANAGEMENT OF SERVICES OPERATIONS (3:3:0) An introduction to management principles and concepts used in service operations.
310. FOOD AND BEVERAGE PURCHASING AND SANITATION (3:3:0) Food and beverage purchasing and sanitation principles for hospitality operations.
320. PROPERTY AND PHYSICAL PLANT MANAGEMENT (3:3:0) Analysis and management of engineering and maintenance systems, including mechanical, electrical, building, environmental, and energy management. Prerequisite: HR&IM 201.
337. FOOD, BEVERAGE, AND LABOR COST CONTROL (3:3:0) Techniques for analyzing and controlling food, beverage, and labor costs in hospitality organizations. Prerequisite: ACCTG 101.
380. LODGING SYSTEMS MANAGEMENT I (3:3:0) Systems analysis, design, and application for hotel functions, including guest services, reservations, reception, telecommunications, guest-city ledger, and the night audit. Prerequisite: ACCTG 101. Prerequisite or concurrent: HR&IM 201.
381. LODGING SYSTEMS MANAGEMENT II (3:3:0) Systems analysis, design, and application for security, housekeeping, and laundry operations management, with additional emphasis on physical design. Prerequisite: HR&IM 380.

HUMAN DEVELOPMENT (H DEV)

100. INTRODUCTION TO HUMAN DEVELOPMENT (1:1:0) Human development as a process of man-environment transactions, and the relationships of various fields to the study of that process.
101. HUMAN GROWTH AND DEVELOPMENT (3:3:0) Factors affecting human development, health, and behavior over the life span: biological, environmental, psychosocial, community, and historical.
102. POLICY AND PLANNING FOR HUMAN DEVELOPMENT (3:3:0) Multidisciplinary analysis of concepts and practice in the creation and administration of social interventions for human development.
200. EMPIRICAL INQUIRY IN HUMAN DEVELOPMENT (3:2:2) Introduction to methods and philosophy of empirical inquiry applied to problems of human development.
395. FIELD PROJECTS (1–12) Independent study and research in a human service program; written and oral summary of rationale, procedures, findings.

HUMAN DEVELOPMENT AND FAMILY STUDIES (HD FS)

129. (GS) INTRODUCTION TO HUMAN DEVELOPMENT AND FAMILY STUDIES (3:3:0) Introduction to psychosocial and family development at all stages of the individual and family life cycle.
216. PERSONAL AND INTERPERSONAL SKILLS (3:3:0) Conceptions of life-span personal and interpersonal skill enhancement.
218. FOUNDATIONS OF MARRIAGE (3:3:0) Factors influencing the husband/wife relationship across the life course.
219. FAMILY FINANCIAL MANAGEMENT (3:3:0) How families plan their finances and factors that determine their decisions.
229. (DS) INFANT AND CHILD DEVELOPMENT (3:3:0) Theory, research, and methods of social/behavioral/biological sciences related to developmental processes and interventions during infancy and childhood.
239. (DS) ADOLESCENT DEVELOPMENT (3:3:0) Social, behavioral, and biological development and intervention throughout adolescence.
249. (DS) ADULT DEVELOPMENT AND AGING (3:3:0) Physiological, psychological, and social development and intervention from young adulthood through old age.
297. SPECIAL TOPICS (1-9)
311. INDIVIDUAL AND FAMILY INTERVENTIONS (3:3:0) Survey of individual and family formal and informal intervention efforts; historical and current perspectives and approaches. Prerequisites: HD FS 129; 3 credits in social, behavioral, or biological sciences.
- 315, 315W. FAMILY DEVELOPMENT (3:3:0) Family functions over the life course: family from a multidisciplinary perspective. Prerequisites: HD FS 129 GS; 3 credits in social, behavioral, or human biological sciences.
327. HUMAN DEVELOPMENT ACROSS THE LIFE SPAN (3:3:0) A review of research and theory on human development across the life span from a multidisciplinary perspective. Prerequisites: I F S 129; 3 credits in social, behavioral, or human biological sciences.
330. OBSERVATION OR EXPERIENCE WITH PRESCHOOL CHILDREN (1-4) Directed observations of, or supervised experience with, preschool children in group or home settings. Prerequisite: HD FS 327 or PSY 213.

HUMANITIES (HUMAN)

001. (GH) VALUES OF THE WESTERN CULTURAL HERITAGE (3:3:0) Fundamental values of human experience as expressed in outstanding philosophical and literary works.
002. (GH) SHAPING OF THE MODERN MIND (3:3:0) Relevance to the present age of influential literary and philosophical texts illustrative of the principal epochs of Western civilization.
021. (DH) IDEAS AND ARTS (3:3:0) Interaction of intellectual and aesthetic values from the Renaissance to the present.
050. (DH) THE LITERATURE AND LORE OF MINING (3:3:0) Experience and values of mining tradition: survey of the literature and lore, including field research.
088. (DH) AUSTRALIAN/NEW ZEALAND CULTURAL PERSPECTIVES (3:3:0) Australian and New Zealand cultural and social perspectives, with emphasis on the historical development of intellectual, aesthetic, and humanistic values.
101. (DH) MODERN SCIENCE AND HUMAN VALUES (3:3:0) Relationships of science to the aspirations, values, and arts of man.
102. THE GRAND TOUR: A VISUAL SURVEY OF EUROPEAN HISTORY (3:3:0) A historical interdisciplinary examination of the visual heritage of Italy, France, Germany, Spain, and the British Isles.

INDUSTRIAL ENGINEERING (I E)

315. INDUSTRIAL ORGANIZATION AND ADMINISTRATION (3:3:0) Fundamental principles of organization leading to intelligent appreciation of the simpler problems of factory organization and operation. Students registered in Industrial Engineering may not schedule this course.

INDUSTRIAL ENGINEERING TECHNOLOGY (IE T)

101. MANUFACTURING MATERIALS AND PROCESSES (3:3:0) Mechanical properties of materials; primary processing methods for manufacturing; dimensional verification, measurement; ferrous, nonferrous metals; important plastic plus ceramic materials.

INSURANCE

102. MANUFACTURING MATERIALS AND PROCESSES LABORATORY (1:0:2) Mechanical properties evaluation, dimensional verification and measurement, laboratory methods, and statistical interpretation of experimental data. Prerequisite or concurrent: IE T 100.
105. ECONOMICS OF INDUSTRY (2:2:0) Internal economics of industrial enterprise, cost factors, and methods of comparing alternate proposals.
109. INSPECTION AND QUALITY CONTROL (3:2:2) Inspection methods and procedures and their applications to control and acceptance sampling based on statistical methods. Prerequisite: MATH 087.
112. MANUFACTURING PROCESSES (3:1:6) Technology related to metal removal/joining/casting; nondestructive testing; hot/cold forming; heat treatment; computer application in manufacturing; engineering measurements. Prerequisite: IE T 101.
215. PRODUCTION DESIGN (3:1:4) Planning and design of tools required for production. Study of advanced technologies in manufacturing, including CNC, robotics, CAD, and CAM. Prerequisites: EG T 201, IE T 112.
297. SPECIAL TOPICS (1-9)

INSURANCE (INS)

102. PERSONAL INSURANCE PLANNING (3:3:0) Introduction to the principles and practices of personal insurance planning. May not be scheduled by College of Business Administration students. Prerequisite: third-semester standing.
301. RISK AND INSURANCE (3:3:0) Introduction to the principles and methods of handling business and personal risks; emphasis on insurance techniques. Prerequisite: fourth-semester standing.

INTERNATIONAL AGRICULTURE (INTAG)

100. (DS) INTRODUCTION TO INTERNATIONAL AGRICULTURE (3:3:0) Survey of agriculture and food production in developing countries; socioeconomic and technical considerations.

INTERNATIONAL UNDERSTANDING (INT U)

200. (DS) INTERNATIONAL UNDERSTANDING AND WORLD AFFAIRS (3:3:0) Interdisciplinary consideration of international problems, conflict and accommodation; impact of various cultures and ideologies on world affairs and foreign policy. Credit will not be given for both this course and PL SC 014. Prerequisite: third-semester standing.

ITALIAN (IT)

001. ELEMENTARY ITALIAN I (4:3:2) For beginners. Grammar, with reading and writing of simple Italian; oral and aural work stressed.
002. ELEMENTARY ITALIAN II (4:3:2) Grammar and reading continued; oral and aural phrases progressively increased; composition. Prerequisite: IT 001.
003. INTERMEDIATE ITALIAN (4:3:2) Advanced grammar; oral and written composition; reading of modern authors; Italian life and culture. Prerequisite: IT 002.
130. (GH) ITALIAN CULTURE AND CIVILIZATION (3:3:0) Italian life from the medieval period to the present; literature, arts, and contemporary problems; Italo-American experience. (In English.)
230. (DH) MASTERPIECES OF ITALIAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Emphasis on works and authors of international importance. Lectures, readings, and written work in English.

JAPANESE (JAPNS)

001. ELEMENTARY JAPANESE I (4:3:2) Introduction to modern Japanese; development of audio-lingual facility and ability to read and write Japanese without aid of romanization.

002. **ELEMENTARY JAPANESE II (4:3:2)** Continuation of elementary Japanese, with emphasis on improving audio-lingual facility and strengthening reading and writing skills in modern Japanese. Prerequisite: JAPNS 001.
003. **INTERMEDIATE JAPANESE (4:3:2)** Continued study of modern Japanese at the intermediate level; extensive audio-lingual practice for conversational fluency; reading/writing original scripts. Prerequisite: JAPNS 002.
110. **CONVERSATION, READING, AND COMPOSITION (3:3:0)** Readings in selected Japanese literature and other texts; practice in conversation and composition. Prerequisite: JAPNS 003.
187. **JAPANESE FRESHMAN SEMINAR (3:3:0)** The meaning and advantages of a Liberal Arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
199. **FOREIGN STUDY—BASIC JAPANESE (1–8)** Small-group instruction in spoken and written modern Japanese at the introductory level.
299. **FOREIGN STUDY—INTERMEDIATE JAPANESE (1–12)** Small-group instruction in spoken and written Japanese at the intermediate level. Prerequisite: JAPNS 002.
296. **INDEPENDENT STUDIES (1–18)**
297. **SPECIAL TOPICS (1–9)**

LABOR AND INDUSTRIAL RELATIONS (L I R)

100. (DS) **INDUSTRIAL RELATIONS (3:3:0)** Introductory analysis of the employment relationship and of the interrelated interests of management, workers, unions, and the public.
101. (DS) **EMPLOYMENT RELATIONSHIP: LAW AND POLICY (3:3:0)** An examination of basic legal principles underlying the employment relationship and their social, political, and economic bases.
102. **THEORIES AND FUNCTIONS OF LABOR ORGANIZATIONS (3:3:0)** Study of the theory and practice of labor organizations: goals, internal structure and operations, and impact on society.
103. **LABOR LAW (3:3:0)** A study of legislation affecting labor organizations and their members.
104. (DS) **THE PRACTICE OF COLLECTIVE BARGAINING (3:3:0)** Study of the factors involved in negotiating labor contracts, the issues, processes, bargaining relationships, and public responsibilities facing the parties.
156. (HIST 156) **HISTORY OF THE AMERICAN WORKER (3:3:0)** A study of the American worker from the preindustrial era to the present.
296. **INDEPENDENT STUDIES (1–18)**

LANDSCAPE ARCHITECTURE (LARCH)

- * 003. (GA) **THE NATURAL AND HISTORIC LANDSCAPE (3:3:0)** Man's changing attitudes toward urban and rural outdoor spaces and their aesthetic and cultural value.
- * 060 (GA) **HISTORY OF LANDSCAPE ARCHITECTURE (3:3:0)** A survey of the historical development of outdoor space in relationship to allied arts from early beginnings to this century.

LATIN (LATIN)

001. **ELEMENTARY LATIN (4:3:2)** Pronunciation; inflections; simple rules of syntax.
002. **ELEMENTARY LATIN (4:3:2)** Advanced syntax and sentence structure. Prerequisite: LATIN 001.
003. **INTERMEDIATE LATIN (4:3:2)** Selected readings from representative authors. Prerequisite: LATIN 002.
187. **LATIN FRESHMAN SEMINAR (3:3:0)** The meaning and advantages of a Liberal Arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
297. **SPECIAL TOPICS (1–9)**

*Students may take only one course for General Education credit from LARCH 003 or 060.

LEISURE STUDIES (LE ST)

120. LEISURE AND HUMAN BEHAVIOR (2:2:0) Introduces leisure from an integrated historical and contemporary perspective. Forces shaping leisure behavior and relationships between leisure and social institutions.
277. LEISURE FOR PERSONS WITH DISABILITIES (3:3:0) Encouragement of appreciation of human diversity and impact of differences on leisure involvement.
236. SUPERVISION AND GROUP DYNAMICS IN LEISURE SERVICES (3:2:2) Supervision as it relates to middle management in leisure service. Theories, strategies, group dynamics, and decision-making authority. Prerequisite: LE ST 105.
356. PROGRAMMING IN LEISURE SERVICES (3:0:0) Translating agency philosophy and policy into understanding of organization, management, implementation, and evaluation of programming in leisure services. Prerequisite: LE ST 236.

LIBRARY STUDIES (L ST)

110. INFORMATION ORGANIZATION AND RETRIEVAL (3:2:2) Information structure and resources related to search and problem-solving procedures to identify, organize, and locate print and nonprint materials. Prerequisite: ENGL 015 or 030.

LINGUISTICS (LING)

001. (GS) THE STUDY OF LANGUAGE (3:3:0) A nontechnical introduction to the study of human language and its role in human interaction. Students who have successfully completed LING 100 may not enroll in LING 001.
100. (GS) FOUNDATIONS OF LINGUISTICS (3:3:0) Systematic study of linguistic structures in a variety of the world's languages; an overview of language and its organization.
102. (DH) INTRODUCTION TO HISTORICAL LINGUISTICS (3:3:0) Language change and linguistic reconstruction; general procedures and techniques used in comparative linguistics; models of languages; linguistic borrowing and influence. Prerequisite: LING 010 or 100.
220. (DS) [PSY 220(DS)] INTRODUCTION TO PSYCHOLINGUISTICS (3:3:0) The learning of language; language development in the child; meaning as a problem for psychology. Prerequisite: PSY 002.

MANAGEMENT (MGMT)

100. SURVEY OF MANAGEMENT (3:3:0) Introduction to organizational factors relevant to management processes, including leadership, motivation, job design, technology, organizational design and environments, systems, change. For non-Business students only.
150. SUPERVISORY MANAGEMENT (3:3:0) Preparation for supervisory positions in formal organizations. Emphasis placed on the motivational aspects of the supervisor's job. Prerequisite: MGMT 100.

MANAGEMENT INFORMATION SYSTEMS (M I S)

100. INTRODUCTION TO MANAGEMENT INFORMATION SYSTEMS (3:3:0) Business computer systems and their impact on management decision making. A student may not receive credit toward graduation for both M I S 100 and M I S 431.
101. MICROCOMPUTER PROGRAMMING IN STRUCTURED BASIC (3:3:0) Introduction to the microcomputer algorithmic process using BASIC as the vehicle to construct computer solutions to common problems.
103. MICROCOMPUTER APPLICATIONS IN BUSINESS (3:3:0) Introduction to current business uses of the microcomputer, including spreadsheets, database management, word processing, and decision-making models.
106. SPECIALIZED MICROCOMPUTER APPLICATIONS IN BUSINESS (1-6) Use of the microcomputer in the functional areas of business (e.g., accounting, management, marketing, finance, etc.). Prerequisites: 3 credits in a business administration appropriate functional area; prior written approval of department.
110. INTRODUCTION TO COBOL (3:3:0) Fundamentals of structured COBOL programming. Prerequisite: M I S 100.
111. ADVANCED COBOL (3:3:0) Advanced structured COBOL programming. Prerequisite: M I S 110.

MARKETING (MKTG)

150. **PROMOTION MANAGEMENT (3:3:0)** The application and management of various forms of persuasive communication with potential customers; personal selling, sales management, advertising, sales promotion. Prerequisite: MKTG 221.
160. **PRINCIPLES OF RETAILING (3:3:0)** Introduction to the management of retailing organizations, with emphasis on decision making. Prerequisite: MKTG 221.
170. **PRINCIPLES OF EFFECTIVE PURCHASING (3:3:0)** Introduction to the purchasing function in organizations, with emphasis on integration of purchasing activity with other aspects of marketing management. Prerequisite: MKTG 221.
180. **PRINCIPLES OF BUSINESS MARKETING (3:3:0)** Introduction to the management of business-to-business marketing strategy. Emphasizes strategic response to industrial marketing opportunities and response to competition. Prerequisite: MKTG 221.
190. **INTRODUCTION TO MARKETING RESEARCH (3:3:0)** Practical aspects of marketing research, with emphasis on practical details of operating a small-scale project. Prerequisites: MKTG 221, Q B A 101.
220. **PERSONAL SELLING (3:3:0)** Principles underlying the sales process and practical application of these principles to selling situations. Studies role of selling in total marketing process. Prerequisite: third-semester standing.
221. **CONTEMPORARY AMERICAN MARKETING (3:3:0)** Social and economic aspects; movement of goods and services from producers to consumers; analysis of marketing functions, systems, and institutions. A student may not receive credit toward graduation for both MKTG 221 and 301. Prerequisite: 3 credits in economics.

MATERIALS ENGINEERING TECHNOLOGY (MAT T)

200. **MATERIALS LABORATORY PRACTICE (3:1:4)** Introduction to the methods used to prepare microstructures of various materials, measure elevated temperature, and perform physical property tests. Prerequisites: CHEM 012, PHYS 150.
201. **PHYSICAL ANALYSIS OF MATERIALS (3:2:2)** A study of the structures in several classes of materials, manipulation of these structures, and the behavior of these materials. Prerequisites: CHEM 014, MATH 087, MAT T 200.
202. **MATERIALS TESTING (3:1:4)** Instruction in the methods used for the mechanical property testing of materials including test specimen design, procedures, and the statistical evaluation of data. Prerequisite: MATH 087.
203. **MATERIALS PRODUCTION AND PROCESSING I (3:2:2)** Analysis of important materials—production from raw sources, processing into usable forms, and their ranges of physical and mechanical properties. Prerequisites or concurrent: MAT T 200, MAT T 202.
204. **MATERIALS PRODUCTION AND PROCESSING II (3:2:2)** A study of materials from their production, processing, and property selection aspects with visits to several materials-related plants. Prerequisites: MAT T 200, 202.
295. **FIELD PRACTICE (3:1:6)** Practical experience in the materials industries through either work assignment or completion of a cooperative project with a company.
- Note:* These courses are deemed to be of sufficient depth that graduates from the MAT T program may pursue studies in most baccalaureate materials-related programs.

MATERIALS SCIENCE (MATSC)

101. (GN) **ENERGY AND FUELS IN SOCIETY (3:3:0)** Energy utilization and technological development; energy resources; energy conversion; patterns, problems, and trends in human use of energy. For nontechnical students.

MATHEMATICS (MATH)

004. **INTERMEDIATE ALGEBRA (3:3:0)** Polynomials, fractions, exponents, radicals, first- and second-degree equations and inequalities, sequences, systems of equations. Limited to students indicating deficiencies on the mathematics (algebra) proficiency examination. This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program.
005. (GQ) **COLLEGE ALGEBRA I (3:3:0)** Polynomial and rational expressions; exponents and radicals; equations and inequalities; functions, relations, and their graphs; exponential and logarithmic functions.

MATHEMATICS

Prerequisite: MATH 004 or satisfactory performance on the mathematics (algebra) proficiency examination.

006. (GQ) PLANE TRIGONOMETRY (3:3:0) Trigonometric functions; solutions of triangles; trigonometric equations; identities. Prerequisites: MATH 005 or satisfactory performance on the mathematics (algebra) proficiency examination; 1 unit of geometry.

007. (GQ) COLLEGE ALGEBRA II AND ANALYTIC GEOMETRY (3:3:0) Nonlinear functions and relations; systems of equations and inequalities; zeros of polynomials; complex numbers; sequences; mathematical induction; binomial theorem. Prerequisite: MATH 005 or satisfactory performance on the mathematics (algebra) proficiency examination.

017. (GQ) FINITE MATHEMATICS (3:3:0) Introduction to logic, sets, probability. Prerequisite: 2 units of high school mathematics.

018. (GQ) ELEMENTARY LINEAR ALGEBRA (3:3:0) Matrices and vectors; transformations; systems of linear equations; convex sets and linear programming. Prerequisite: 2 units of high school mathematics.

035. (GQ) GENERAL VIEW OF MATHEMATICS (3:3:0) Survey of mathematical thought in logic, geometry, combinatorics, and chance.

036. (GQ) INSIGHTS INTO MATHEMATICS (3:3:0) Examples of mathematical thought in number theory, topology, theory of symmetry, and chance. Prerequisite: 1 unit of algebra or MATH 004.

087. (GQ) TECHNICAL MATHEMATICS (5:5:0) Algebraic expressions, exponents, radicals, equations, graphs, systems of equations, trigonometric functions, solution of right triangles, vectors, complex numbers. Prerequisite: MATH 004 or satisfactory performance on the mathematics proficiency examination.

088. (GQ) TECHNICAL MATHEMATICS AND CALCULUS (5:5:0) Logarithm, inverse trigonometric functions, trigonometric identities, inequalities, series, limits, differentiation, higher order derivatives, implicit differentiation, applications, integration, areas, volumes, differential equations. Prerequisite: MATH 087.

110. (GQ) TECHNIQUES OF CALCULUS I (4:4:0) Functions, graphs, derivatives, integrals, techniques of differentiation and integration, exponentials, improper integrals, applications. Students may take only one course for credit from MATH 110, 140, and 140A. Prerequisite: MATH 005 or satisfactory performance on the mathematics (algebra) proficiency examination.

111. (GQ) TECHNIQUES OF CALCULUS II (2:2:0) Analytic geometry, partial differentiation, maxima and minima, differential equations. Prerequisite: MATH 110.

140. (GQ) CALCULUS WITH ANALYTIC GEOMETRY I (4:4:0) Functions; limits; analytic geometry; derivatives, differentials, applications; integrals, applications. Students may take only one course for credit from MATH 110, 140, and 140A. Prerequisites: MATH 006, 007; or MATH 040; or MATH 041; or satisfactory performance on the mathematics (both algebra and trigonometry) proficiency examination.

140A. (GQ) CALCULUS, ANALYTIC GEOMETRY, ALGEBRA, AND TRIGONOMETRY (6:6:0) Review of algebra and trigonometry; analytic geometry; functions; limits; derivatives, differentials, applications; integrals, applications. Students may take only one course for credit from MATH 110, 140, and 140A. Prerequisite: satisfactory performance on the mathematics (algebra) proficiency examination.

141. (GQ) CALCULUS WITH ANALYTIC GEOMETRY II (4:4:0) Derivatives, integrals, applications; sequences and series; analytic geometry; polar coordinates; partial derivatives. Prerequisite: MATH 140 or 140A.

200. (GQ) NUMBER SYSTEMS (3:3:0) Introduction to sets and logic, properties of the natural numbers, integers, rational and real numbers, algorithms, applications to geometry. For elementary education students only.

220. MATRICES (2:2:0) Systems of linear equations; matrix algebra; eigenvalues and eigenvectors; linear systems of differential equations. Prerequisite: MATH 110 or 140.

230. CALCULUS AND VECTOR ANALYSIS (4:4:0) Three-dimensional analytic geometry; vectors in space; partial differentiation; double and triple integrals; integral vector calculus. Students who have passed either MATH 231 or 232 may not schedule MATH 230 for credit. Prerequisite: MATH 141.

231. CALCULUS OF SEVERAL VARIABLES (2:2:0) Analytic geometry in space; differential and integral calculus of several variables. Students who have passed MATH 230 may not schedule this course. Prerequisite: MATH 141.

232. INTEGRAL VECTOR CALCULUS (2:2:0) Multidimensional analytic geometry; potential fields; flux; Green's divergence and Stokes's theorem. Students who have passed MATH 230 may not schedule this course. Prerequisite: MATH 231.

250. ORDINARY DIFFERENTIAL EQUATIONS (3:3:0) First- and second-order equations; special functions; Laplace transform solutions; higher order equations. Students who have passed MATH 251 may not schedule this course for credit. Prerequisite: MATH 141.

251. ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS (4:4:0) First- and second-order equations; special functions; Laplace transform solutions; higher order equations; Fourier series; partial differential equations. Prerequisite: MATH 141.

800. BUSINESS MATHEMATICS (3:3:0) Operations with whole numbers, fractions, and mixed numbers, decimals and percent, formulas and equations, percentages and interest, introduction to algebra.

MECHANICAL ENGINEERING TECHNOLOGY (ME T)

100. MECHANISMS (2:0:4) Motion in machine elements; strength and properties of materials; design of machine elements. Prerequisite: MCH T 111.
105. KINEMATICS (3:2:3) Graphical and analytical studies of relative motions, instant centers, velocity and acceleration in plane motions, slider crank mechanisms, cams, gears, gear trains, and flexible connectors. Prerequisite: EG T 101, 102, MCH T 111.
206. MACHINE ELEMENTS AND DYNAMICS (3:2:2) Graphical and analytical study of motion in various mechanisms, including cams, gears, gear trains, and flexible connectors; introduction to kinetics. Prerequisites: EG T 101, MCH T 111. Concurrent: CMPSC 101.
207. HEAT TRANSFER (3:3:0) Basic principles of conduction, convection, and radiation, emphasizing practical applications.
210. PRODUCT DESIGN (3:2:3) Design of machine elements including levers, bearings, shafts, clutches, springs, and gears; selection of ball bearings and belts; design of small mechanical devices. Prerequisites: MCH T 213, ME T 105.
281. ELEMENTARY THERMO- AND FLUID DYNAMICS (4:4:0) Basic problems in compressible fluid flow. Laws of dynamics and thermodynamics, mechanical properties of fluids, elementary heat transfer. Prerequisite or concurrent: MATH 088, PHYS 150.
282. AIR RESOURCE MANAGEMENT (2:2:0) Introduction to air pollution. Pollutants, sources, effects, air monitoring systems, air quality criteria and standards, governmental control programs and procedures.
284. SAMPLING AND MONITORING PROGRAM (2:0:4) Instrumentation and site selection, field data acquisition for major air pollutants, data analysis and evaluation.
297. SPECIAL TOPICS (1-9)

MECHANICAL TECHNOLOGY (MCH T)

110. BASIC MECHANICS (2:2:0) Forces; moments; resultants; equilibrium of force systems; introduction to dynamics. Prerequisite: MATH 087.
111. MECHANICS FOR TECHNOLOGY: STATICS (3:3:0) Forces; moments; resultants; two- and three-dimensional equilibrium of force systems; friction; centroids and moments of inertia of areas. Prerequisite MATH 087. Prerequisite or concurrent: CMPSC 101.
212. INTRODUCTION TO DYNAMICS (3:2:2) Absolute and relative motion related to particles and simple linkages. Force-mass-acceleration, work-energy, and impulse-momentum solution techniques. Prerequisite: MCH T 111. Prerequisite or concurrent: MATH 088.
213. STRENGTH AND PROPERTIES OF MATERIALS (3:3:0) Axial stress and strain; shear; torsion; beam stresses and deflections; combined axial and bending stresses; columns, ductility, resilience, and toughness. Prerequisite: MCH T 111. Concurrent: CMPSC 101.
214. STRENGTH AND PROPERTIES OF MATERIALS LABORATORY (1:0:2) Measurement of mechanical properties of materials; structural testing, data acquisition and analysis; technical laboratory report writing. Concurrent: MCH T 213.

MEDIEVAL STUDIES (MEDVL)

107. (DH) [HIST 107(DH)] MEDIEVAL EUROPE (3:3:0) Rise and development of the civilization of medieval Europe from the decline of Rome to 1500.
108. (DH) MEDIEVAL CIVILIZATION (3:3:0) An interdisciplinary introduction to literature, art, and thought of the Middle Ages.

METEOROLOGY (METEO)

002. (GN) WEATHER AND SOCIETY (2:2:0) Nontechnical treatment of fundamentals of modern meteorology; effect of weather and climate on society and its activities. A student who took METEO 003 for more than 1 credit may not take this course.
003. (GN) INTRODUCTORY METEOROLOGY (3:2:2) Nontechnical treatment of fundamentals of modern meteorology; effect of weather and climate on man and his activities. A student who took METEO 002 may take the laboratory part of this course for 1 credit only.

MICROBIOLOGY (MICRB)

106. (GN) ELEMENTARY MICROBIOLOGY (2:2:0) Importance of microorganisms in public health and disease, agriculture, and industry; descriptive course for nontechnical students.

107. (GN) ELEMENTARY MICROBIOLOGY LABORATORY (1:0:3) Selected techniques with regard to recognition and enumeration of bacteria; effects of chemical and physical agents on microorganisms. Prerequisite or concurrent: MICRB 106.

150. INTRODUCTORY MEDICAL LABORATORY TECHNOLOGY (4:2:10) Introduction to basic principles and procedures of clinical laboratory work. Practicum emphasizes proper collection, handling, and preparation of biological samples. Prerequisite: admission to 2-MLT program.

151. SEMINAR AND PRACTICUM FOR MEDICAL LABORATORY TECHNICIANS (2-17 per semester, maximum of 28) Lectures and laboratory sessions introduce methods and procedures, underlying principles, and their applications in clinical practice. Prerequisites: MICRB 150, 201, 202, CHEM 034, BIOL 041.

Unit A. Clinical Chemistry (7) Basic principles and procedures for measuring chemical components of blood and other body fluids.

Unit B. Clinical Microbiology/Serology (6) Properties and identification of normal and abnormal microbial flora. Antigen-antibody interactions of diagnostic importance.

Unit C. Hematology (6) Red and white blood cell identification and enumeration. Related procedures for diagnosing normal or disease states.

Unit D. Immunohematology (6) Immunologic considerations necessary for the transfusion of blood and blood products.

Unit E. Urinalysis (2) Identification of cellular and crystalline urinary sediments. Qualitative chemical analysis of urine.

201. INTRODUCTORY MICROBIOLOGY (3:3:0) Elementary principles of microbial and viral interrelationships, morphology, and physiology; relation to food, water, soil, industry, and disease processes.

202. INTRODUCTORY MICROBIOLOGY LABORATORY (2:0:4) Qualitative and quantitative techniques with regard to recognition of bacteria and their processes on a microscopic, colonial, and physiological basis. Prerequisite: CHEM 012. Prerequisite or concurrent: MICRB 201.

MICROCOMPUTER PROCESSING (MCMP)

240. MICROPROCESSOR INTERFACING (5:4:2) Examination of the devices used in microprocessor systems to communicate with external digital and analog systems. Prerequisite: EE T 210. Concurrent: EE T 211.

241. ADVANCED MICROPROCESSOR SYSTEMS (4:3:2) Development of an understanding of microprocessor principles and systems through a study of current 8- and 16-bit microprocessors. Prerequisite: EE T 211.

242. MICROPROCESSOR SYSTEMS DESIGN AND ANALYSIS (3:1:4) Experience in designing, constructing, and testing a complete microcomputer system and its practical application to control. Prerequisite: EE T 211.

297. SPECIAL TOPICS (1-9)

MINERAL PROCESSING (MN PR)

061. INTRODUCTION TO COAL PREPARATION (3:3:0) Theory and application of modern coal preparation practice. Sampling, crushing, sizing, gravity concentration, flotation, dewatering, drying; pollution control; flow-sheets.

MINING (MNG)

023. MINERAL LAND AND MINE SURVEYING (3:0:9) Surveying theory and practice applied to mineral lands and mines; traversing, leveling, mapping, shaft plumbing; underground surveying; microcomputer drafting and graphics. Prerequisites: E G 011, 1/2 unit of secondary school trigonometry.

030. INTRODUCTION TO MINING ENGINEERING (2:2:0) Examination, development, and exploitation of mineral deposits; mining methods; unit operations; mining equipment; fundamentals of explosives.

MUSIC (MUSIC)

Note: For a complete list of music courses that satisfy General Education program requirements, see the *Penn State Baccalaureate Degree Programs Bulletin*.

005. (GA) AN INTRODUCTION TO WESTERN MUSIC (3:3:0) A general survey of art music in Western society, highlighting important composers and stylistic developments.
008. (GA) RUDIMENTS OF MUSIC (3:3:0) Introduction to the elements of music: notation, scales, meter, rhythm, intervals; basic chord structure. For non-Music majors.

NUCLEAR ENGINEERING TECHNOLOGY (NE T)

201. APPLIED RADIOLOGICAL SAFETY (3:3:0) Discussion of basic radiation dose units, radiation dosimetry, biological effects of radiation, radiation monitoring techniques, government regulations, and radwaste management. Concurrent: NE T 202.
202. REACTOR TECHNOLOGY I (4:4:0) Atomic and nuclear structure, electromagnetic radiation, nuclear radiations, nuclear interactions, and fission. Prerequisite: MATH 088. Concurrent: PHYS 151.
203. APPLIED THERMODYNAMICS (3:3:0) Fundamentals based on first and second laws of thermodynamics; properties of pure substances; vapor cycles for power generation. Prerequisite: MATH 088. Concurrent: PHYS 151.
204. REACTOR TECHNOLOGY II (3:3:0) Survey of various reactor types; neutron diffusion, steady state reactor theory and applications; kinetic behavior of reactors. Prerequisite: NE T 202.
205. NUCLEAR TECHNOLOGY LABORATORY I (2:1:2) Study of radiological safety, radiation measurements, radiation detection instrumentation, and radioactive decay. Prerequisites or concurrent: NE T 201, PHYS 151.
212. NUCLEAR TECHNOLOGY LABORATORY II (3:1:3) Laboratory study of radiation measurements and the diversified application of nuclear techniques and detection systems. Prerequisites: NE T 201, 205.
214. REACTOR TECHNOLOGY LABORATORY (3:1:4) Simulator study of various reactor components and safety systems; emphasis placed upon reactor operation. Prerequisites: NE T 202. Concurrent: NE T 204.
215. APPLIED HEAT TRANSFER (3:3:0) Basic principles of conduction, convection, and radiation. Emphasis placed on nuclear fuel heat removal. Prerequisite: NE T 202. Concurrent: NE T 204.
220. ELECTRICAL GENERATION ORIENTATION (1:1:0) Introduction and comparison of methods of generating electricity; description of the variety of occupations in the electrical generating industry.
221. INTRODUCTORY BOILING WATER REACTOR TECHNOLOGY (1:1:0) Introduction to the concept of commercial power generation of electricity through the use of a boiling water reactor.
222. POWER PLANT QUALITY ASSURANCE/QUALITY CONTROL (1:1:0) Introduction to concepts of quality assurance/quality control; historical development of standards and regulatory guides; specific applications to nuclear plants.
297. SPECIAL TOPICS (1-9)

NURSING (NURS)

101. NURSING I (8:4:12) Introduction to associate degree nursing roles and nursing process; emphasis on individual health patterns and selected nursing interventions. Prerequisite or concurrent: BIOL 041, 042, HD FS 129 GS.
102. NURSING II (8:4:12) Common and well-defined health problems with integrated nursing content; emphasis on infancy through young adulthood and mental health nursing. Prerequisite: NURS 101.
201. NURSING III (9:4:15) Develop expanding competencies in caring for clients with dysfunctional health patterns; emphasis on middle-age adults and perioperative nursing care. Prerequisite: NURS 102.
202. NURSING IV (10:5:15) Develop increased skills utilizing the nursing process; emphasis on care of older adults with complex dysfunctional health patterns. Prerequisite: NURS 201.

NUTRITION (NUTR)

100. (GHS) CONTEMPORARY NUTRITION CONCERNS (1:1:0) Interpretation of nutrition principles in relation to contemporary problems in selecting food for growth, development, and health. Students who have received credit for NUTR 150 or 251 may not schedule this course.

OPERATIONS MANAGEMENT

150. **ELEMENTARY NUTRITION (2:2:0)** Fundamentals of nutrition and its relation to human health. Students who have passed NUTR 251 may not schedule this course.
151. **NUTRITION COMPONENT OF THE FOOD SERVICE SYSTEM (3:3:0)** Introduction to basic nutrition principles and their application in a food service system. Students who have taken NUTR 150 or 251 may not schedule this course.
251. **(GHS) INTRODUCTORY PRINCIPLES OF NUTRITION (3:3:0)** The nutrients: food sources and physiological functions as related to human growth and well-being throughout life; current nutrition issues. Students who have passed NUTR 150 may not schedule this course.
252. **DIET THERAPY AND NUTRITION CARE IN DISEASE (4:3:2)** Principles of nutrition care to meet therapeutic needs, inpatient care, and rehabilitation. Prerequisites: NUTR 251 or 151.

OPERATIONS MANAGEMENT (OPMGT)

150. **PRODUCTION AND OPERATIONS MANAGEMENT (3:3:0)** Quantitative tools and techniques used in managing the production function of a firm, including inventory control, production scheduling, capacity planning. Prerequisite: MATH 005.

PHILOSOPHY (PHIL)

- * 001. **(GH) BASIC PROBLEMS OF PHILOSOPHY (3:3:0)** Issues such as the foundations of knowledge, the existence of God, the problem of freedom, and the nature of reality.
003. **(GH) MORAL VALUES (3:3:0)** Freedom, choice, and obligation in conduct; values and the foundations of ethics.
- * 004. **(GH) MAJOR FIGURES IN PHILOSOPHY (3:3:0)** Introduction to philosophy through the study of the writings of representative thinkers in the history of philosophy.
010. **(GH) CRITICAL THINKING AND ARGUMENT (3:3:0)** Principles of correct thinking; deductive and inductive inference; use and misuse of language in reasoning.
012. **(GQ) ELEMENTS OF SYMBOLIC LOGIC (3:3:0)** Translating arguments into symbolic form and establishing validity. For nonscience majors.
100. **(DH) THE MEANING OF HUMAN EXISTENCE (3:3:0)** A study of some philosophical ways of viewing the purpose of life, the good life, and history and its meaning.
102. **(DH) EXISTENTIALISM (3:3:0)** Exploration of a controversial modern mode of philosophizing about life, death, absurdity, and faith.
103. **(DH) ETHICS AND SOCIAL ISSUES (3:3:0)** Ethical issues such as war, privacy, crime and punishment, racism and sexism, civil liberties, affirmative action, abortion, and euthanasia.
104. **(DH) ETHICS AND THE PROFESSIONS (3:3:0)** The philosophical basis for the ethics of professional practice; illustrations include law, business, public administration, journalism, engineering, teaching, medicine.
105. **INTRODUCTION TO THE PHILOSOPHY OF LAW (3:3:0)** Topics normally include concepts of law and responsibility, justice and punishment, legal ethics, and the limits of law.
106. **BUSINESS ETHICS (3:3:0)** A study of ethical issues that confront the business community. Designed primarily for majors in the College of Business Administration.
108. **(DH) SOCIAL AND POLITICAL PHILOSOPHY (3:3:0)** Philosophical analysis of political and communal order; theories of individual and group action within the structures of social obligation.
109. **(DH) PHILOSOPHY OF ART (3:3:0)** Exploration of questions about aesthetic experience, creativity, theories of beauty, principles of criticism in the arts and literature.
110. **(DH) CONSTRUCTION OF SCIENTIFIC CONCEPTS (3:3:0)** The development of scientific concepts, and the relationship of scientific thought and culture.
111. **(DH) ORIENTAL PHILOSOPHY (3:3:0)** Study of philosophical, aesthetic, and religious ideas in the classics of Eastern thought.
124. **(DH) PHILOSOPHY OF RELIGION (3:3:0)** Nature and development of Western religion with interpretation of its significance in contemporary culture. Prerequisite: third-semester standing.
205. **(DH) ANCIENT PHILOSOPHY (3:3:0)** The movements of thought and major thinkers from the pre-Socratics to the neo-Platonists; emphasis on Plato and Aristotle.
206. **(DH) MODERN PHILOSOPHY (3:3:0)** Thinkers from the Renaissance to Kant; empiricism, rationalism, critical philosophy; interaction of philosophy with the revolutions in science, religion, and politics.
207. **(DH) MEDIEVAL PHILOSOPHY (3:3:0)** The movements of thought and major thinkers from the fourth to the fifteenth centuries.

*Students may take only one course for General Education credit from PHIL 001 or 004.

212. (GQ) **SYMBOLIC LOGIC (3:3:0)** The logic of propositions, relations, and quantification; the nature and properties of formal systems. Intended primarily for science-oriented students.
218. (DH) **CONTEMPORARY PHILOSOPHY (3:3:0)** Analysis of the present climate of philosophical thought and its relation to contemporary patterns of culture.
221. (DH) **PHILOSOPHY OF SCIENCE (3:3:0)** An inquiry into the form and function of concepts, laws, theories, and into the character of scientific explanation and prediction.

PHYSICAL EDUCATION (P E)

Physical education courses with the suffix GPE satisfy the physical education portion of the Health Sciences and Physical Education General Education program requirements. For a current list of P E courses, see the *Penn State Baccalaureate Degree Programs Bulletin*.

PHYSICAL SCIENCE (PH SC)

007. **PHYSICAL SCIENCE (3:3:0)** Development of physics, including modern physical concepts and their relationship to the careers of physical scientists. May not be scheduled by students who have received credit for PHYS 100, 201, 215, or 221.
008. **PHYSICAL SCIENCE (3:3:0)** Selected concepts of chemistry showing their development, interrelationship, and present status. May not be scheduled by students who have received credit for CHEM 001 or 002.

PHYSICS (PHYS)

001. (GN) **THE SCIENCE OF PHYSICS (3:3:0)** Historical development and significance of major concepts and theories, with emphasis on the nature of physical science and its role in modern life. For students in nontechnical fields.
150. (DN) **TECHNICAL PHYSICS (3:2:2)** Elementary treatment of topics in mechanics, heat, wave motion, and sound leading toward an understanding of technical applications. Prerequisite: 1-1/2 units of algebra. Prerequisite or concurrent: MATH 087.
151. **TECHNICAL PHYSICS (3:2:2)** Elementary treatment of topics in electricity, light, and modern physics leading toward an understanding of technical applications. Prerequisite: PHYS 150.
201. (DN) **GENERAL PHYSICS (4:4:0)** Mechanics. Concurrent: MATH 140.
202. (DN) **GENERAL PHYSICS (4:3:2)** Electricity and magnetism. Prerequisite: PHYS 201. Concurrent: MATH 141.
203. (DN) **GENERAL PHYSICS (3:3:0)** Wave motion, thermodynamics, and modern physics. Prerequisite: PHYS 202.
204. (DN) **GENERAL PHYSICS (4:3:2)** Wave motion, thermodynamics, and modern physics, with laboratory. Prerequisite: PHYS 202.
215. (DN) **INTRODUCTORY PHYSICS (4:3:2)** Selected topics in mechanics, heat, and sound. Prerequisite: algebra to quadratics.
221. (DN) **FUNDAMENTALS OF PHYSICS (4:4:0)** Classical and modern physics—mechanics. Designed primarily for science and engineering science majors. Concurrent: MATH 140.
222. (DN) **FUNDAMENTALS OF PHYSICS (4:3:2)** Classical and modern physics—electricity and magnetism. Designed primarily for science and engineering science majors. Prerequisite: PHYS 201 or 221. Concurrent: MATH 141.
224. (DN) **FUNDAMENTALS OF PHYSICS (4:3:2)** Classical and modern physics—wave motion and thermodynamics. Designed primarily for science and engineering science majors.
225. **FUNDAMENTALS OF PHYSICS (3:3:0)** Classical and modern physics—quantum physics. Designed primarily for science and engineering science majors. Concurrent: PHYS 203 or 204 or 205.
237. **INTRODUCTION TO QUANTUM PHYSICS (3:3:0)** Relativity and quantum theory applied to selected topics in atomic, molecular, solid state, and nuclear physics. Concurrent: PHYS 203 or 204 or 224.
255. (DN) **PHYSICS OF MUSIC AND SPEECH (3:3:0)** Descriptive study of vibration and sound waves, hearing and speech, musical instruments, physical bases of harmony and scales.
265. (DN) **INTRODUCTORY PHYSICS (4:3:2)** Selected topics in light, electricity, and magnetism. Prerequisite or concurrent: PHYS 215.
297. **SPECIAL TOPICS (1-9)**

POLITICAL SCIENCE (PL SC)

001. (GS) AMERICAN NATIONAL GOVERNMENT (3:3:0) Development and nature of American political culture; constitutional and structural arrangements; policy-making processes; sources of conflict and consensus.
002. AMERICAN PUBLIC POLICY (3:3:0) Examination of selected areas of public policy in America. Analysis of policy content, alternatives, and impact. Prerequisite: PL SC 001.
003. (GS) INTRODUCTION TO COMPARATIVE POLITICS (3:3:0) Introduction to study of government and politics: normative and empirical theories; governmental functions in modern communities; representative structures and processes.
014. (GS) INTERNATIONAL RELATIONS (3:3:0) Characteristics of modern nation-states and forces governing their international relations; nationalism; imperialism; diplomacy; current problems of war and peace. Credit will not be given for both this course and INT U 200.
020. COMPARATIVE POLITICS—WESTERN EUROPE (3:3:0) Comparative analysis of political cultures, interest groups, parties, and decision-making processes in principal Western European political systems.

PORTUGUESE (PORT)

001. ELEMENTARY PORTUGUESE I (4:3:2) For beginners. Grammar, with reading and writing of simple Portuguese; oral and aural work stressed.
002. ELEMENTARY PORTUGUESE II (4:3:2) Grammar, reading, and conversation continued; special emphasis on the language, literature, and life of Brazil. Prerequisite: PORT 001.
003. INTERMEDIATE PORTUGUESE (4:3:2) Grammar, reading, composition, and conversation. Prerequisite: PORT 002.
187. PORTUGUESE FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a Liberal Arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

POULTRY SCIENCE (PTYSC)

201. INTRODUCTION TO POULTRY MANAGEMENT (1:1:0) Business management in the production, processing, and marketing of broilers, eggs, and turkeys.
202. COMMERCIAL POULTRY PRACTICE (2:0:4) Commercial management procedures and techniques; feeding practices, selection and mating, disease control, housing, equipment, ventilation, and processing. Prerequisite or concurrent: PTYSC 201.

PSYCHOLOGY (PSY)

002. (GS) PSYCHOLOGY (3:3:0) Introduction to general psychology; principles of human behavior and their applications.
015. ELEMENTARY STATISTICS IN PSYCHOLOGY (4:3:2) Frequency distributions and graphs; measure of central tendency and variability; normal probability curve; elementary sampling and reliability; correlations; simple regression equations. Prerequisites: PSY 002; MATH 005 or 2 units of secondary school algebra.
021. CURRENT APPLICATIONS OF PSYCHOLOGY (3:3:0) Topics may be drawn from but not limited to opinion research, selection and placement, behavior modification, attitude measurement and change. Prerequisite: PSY 002.
037. MENTAL HEALTH (3:3:0) Maintaining adjustment, developing a well-balanced personality; behavior disorders and their treatment. May not be used as a prerequisite for any course in Psychology. Not open to Psychology majors or those who have received credit for PSY 437.
170. PSYCHOLOGY OF WOMEN (3:3:0) Psychology of women in historical perspective and present evolution. Stresses women's self-concepts with relation to individual and social psychological health. Prerequisite: PSY 002.
174. (SOC 174) PSYCHOLOGICAL AND SOCIOLOGICAL ASPECTS OF DEATH (3:3:0) An introductory, interdisciplinary approach to the psychology and sociology of death, stressing the significance of, and attitudes toward, mortality. Prerequisites: PSY 002, SOC 001.
202. (DS) INTRODUCTION TO PERCEPTION (3:3:0) Survey of human perception and processing of perceptual information, with some reference to animal literature. Emphasizes vision and audition. Prerequisite: PSY 002.

READING, COMMUNICATION, AND LANGUAGE EDUCATION

203. **NEUROLOGICAL BASES OF HUMAN BEHAVIOR (3:3:0)** An introduction to biopsychology, emphasizing the structure and function of the human brain.
204. **(DS) INTRODUCTION TO LEARNING (3:3:0)** A general survey of the learning area, including animal and human experiments, with the applicability of learning principles being discussed. Prerequisite: PSY 002.
211. **VOCATIONAL BEHAVIOR (3:3:0)** Theories of vocational selection and career change; research and application.
213. **(DS) INTRODUCTION TO DEVELOPMENTAL PSYCHOLOGY (3:3:0)** Developmental principles; physical growth; linguistic, intellectual, emotional, and social development from infancy to maturity. Prerequisite: PSY 002.
220. **(DS) [LING 220 (DS)] INTRODUCTION TO PSYCHOLINGUISTICS (3:3:0)** The learning of language; language development in the child; meaning as a problem for psychology.
221. **(DS) INTRODUCTION TO COGNITIVE PSYCHOLOGY (3:3:0)** Introduction to study of such higher mental processes as thinking and reasoning, imagery, concept formation, problem solving, and skilled performance. Prerequisite: PSY 002.
231. **(DS) INDUSTRIAL PSYCHOLOGY (3:3:0)** Personnel selection, training, accident prevention, morale, and organizational behavior. Prerequisites: PSY 002; PSY 015 or STAT 200.
236. **(DS) [RL ST 236 (DS)] PSYCHOLOGIES OF RELIGION (3:3:0)** Introduction to major Western psychologies of religion (James, Freud, Jung) and to subsequent extensions of and departures from them.
237. **(DS) [RL ST 237 (DS)] RELIGIONS, CULTURES, AND THERAPIES (3:3:0)** Comparison of methods and goals of selected religious and secular therapies within their cultural contexts. Prerequisite: PSY 002.
296. **INDEPENDENT STUDIES (1–18)**

QUANTITATIVE BUSINESS ANALYSIS (Q B A)

200. **INTRODUCTION TO STATISTICS FOR BUSINESS (3)** Statistical inference: estimation, hypothesis testing, correlation, and regression; application of statistical techniques to economic and business problems. Prerequisite: MATH 005, 018, 110, or 140.
201. **QUANTITATIVE METHODS FOR BUSINESS DECISIONS (3)** Introduction to quantitative methods for conceptualizing business and management problems. Prerequisite: MATH 005, 018, 110, or 140.

RADIOLOGIC TECHNOLOGIST RADIOGRAPHER (R T R)

101. **ORIENTATION AND MEDICAL TERMINOLOGY (3)** Radiology history, radiation protection principles, medical ethics, with introduction to medical profession's language.
102. **RADIOGRAPHIC POSITIONING I: NURSING PROCEDURES/CONTRAST MEDIA (3)** Basic positional terminology; emphasis on skeleton with introduction to skull; radiological applications of contrast media and nursing pertinent to radiology. Prerequisite: R T R 101.
103. **RADIOGRAPHIC EXPOSURE I: FILM CRITIQUE I (3)** Preliminary exposure factors concerning radiographic imaging; evaluation of radiographic films. Prerequisite: R T R 102.
104. **RADIOGRAPHIC POSITIONING II: SPECIAL PROCEDURES (3)** Cranium and body system positioning; invasive contrast procedures pertinent to radiology. Prerequisites: R T R 103.
105. **RADIOGRAPHIC EXPOSURE II: DARKROOM CHEMISTRY; FILM CRITIQUE II (3)** Continuation of exposure factors concerning radiographic imaging, with emphasis on problem solving, evaluation of radiographs, and radiographic chemistry with processing techniques. Prerequisite: R T R 104.
106. **RADIOGRAPHIC POSITIONING III: MEDICAL/SURGICAL DISEASES (3)** Review of skeletal, cranium, and body systems, with emphasis on specialized positioning. Definition of various pathologies pertinent to bodily systems. Prerequisites: BIOL 014, R T R 105.
107. **REGISTRY REVIEW I AND II (3:5:17)** Registry Review I and II includes material in all required R T R courses, with emphasis upon national board examination. Prerequisite: R T R 106.

READING, COMMUNICATION, AND LANGUAGE EDUCATION (RCLED)

005. **COLLEGE READING IMPROVEMENT I (3:3:0)** Improvement of basic reading skills: vocabulary development; literal and interpretative comprehension; application of these skills more efficiently into college work. Prerequisite: limited to students whose academic profile sheets indicate help in reading is needed.

REAL ESTATE

010. COLLEGE READING IMPROVEMENT II (3:3:0) Development of higher level comprehension, vocabulary, and study skills incorporated into content area reading. Prerequisite: RCLED 005.

REAL ESTATE (R EST)

100. REAL ESTATE PRACTICE (3:3:0) Study of real estate to enable individuals to make successful transactions and decisions. Not available to baccalaureate students or to those who have taken R EST 301.

301. REAL ESTATE FUNDAMENTALS (3:3:0) Introduction to urban real estate; economic forces affecting property rights; real estate markets and finance; land-use analysis; government policies.

RELIGIOUS STUDIES (RL ST)

Note: For a complete list of Religious Studies courses that satisfy the General Education program requirements, see the *Penn State Baccalaureate Degree Programs Bulletin*.

001. (GH) INTRODUCTION TO WORLD RELIGIONS (3:3:0) A historical and comparative survey of the principal beliefs and practices of the world's major religions.

003. (GH) INTRODUCTION TO THE RELIGIONS OF THE EAST (3:3:0) Religious experience, thought, patterns of worship, morals, and institutions in relation to culture in Eastern religions.

004. (GH) JEWISH AND CHRISTIAN FOUNDATIONS (3:3:0) Introduction to the perspectives, patterns of worship, morality, historical roots, and institutions of the Judaeo-Christian traditions; their relationships to culture.

140. (DH) RELIGION IN AMERICAN LIFE AND THOUGHT (3:3:0) The function, contributions, tensions, and perspectives of religion in American culture.

RURAL SOCIOLOGY (R SOC)

* 011. (GS) INTRODUCTORY RURAL SOCIOLOGY (3:3:0) Basic sociological concepts applied to rural societal institutions and change in rural communities, some historical causes and current consequences.

RUSSIAN (RUS)

001. ELEMENTARY RUSSIAN I (4:3:2) Audio-lingual approach to basic Russian; writing. Students who have received high school credit for two or more years of Russian may not schedule this course for credit without permission of the department.

002. ELEMENTARY RUSSIAN II (4:3:2) Audio-lingual approach to basic Russian continued; writing. Students who have received high school credit for four years of Russian may not schedule this course for credit without permission of the department. Prerequisite: RUS 001.

003. INTERMEDIATE RUSSIAN (4:3:2) Emphasis on reading unsimplified texts; composition; grammatical analysis. Prerequisite: RUS 002.

005. ELEMENTARY TECHNICAL RUSSIAN: ACQUISITION OF SKILLS IN READING (4:3:2) An introduction to the study of Russian grammar and the theory and practice of translation.

006. RUSSIAN TEXTS AND ELEMENTARY TECHNICAL WRITING (4:3:2) Instruction in the theory and techniques of translation and elementary technical writing. Prerequisite: RUS 005 or 001G.

100. (GH) RUSSIAN CULTURE AND CIVILIZATION (3:3:0) The Russian people from the tenth century to present times; their literature, arts, music, science, and philosophy. In English.

110. (DH) RUSSIAN FOLKLORE (3:3:0) Study of *byliny*, lyrical and historical songs, folktales, drama, ceremonial poetry, chants, charms, proverbs, and mythology of Russia. In English.

120. (DH) THEATRICAL ARTS OF RUSSIA (3:3:0) Survey of Russian dramatic literature, including plays, operas, ballets, and cinema. In English.

141, 141W. RUSSIAN LITERATURE IN ENGLISH TRANSLATION: 1800–1870 (3:3:0) Pushkin, Lermontov, Gogol, the critics, Turgenev, Dostoevsky, Tolstoy. Writing assignments will serve as a major way of exploring subject matter.

*Students may take only one course for General Education credit from R SOC 011 or SOC 001.

- 142, 142W.* RUSSIAN LITERATURE IN ENGLISH TRANSLATION: 1870–PRESENT (3:3:0) Dostoevsky, Tolstoy, Chekhov, Gorky, symbolists, selected Soviet authors. Writing assignments will serve as a major way of exploring subject matter.
187. RUSSIAN FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a Liberal Arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
204. READINGS IN RUSSIAN I (3:3:0) Intensive reading of Russian texts, mainly short fiction of classic Russian authors; conversation; composition. Prerequisite: RUS 003 or 006.
214. READINGS IN RUSSIAN II (3:3:0) Intensive readings of Russian texts, mainly nineteenth-century memoirs and intellectual history; conversation; composition. Prerequisite: RUS 003 or 006.
221. RUSSIAN CONVERSATION (3:3:0) Practice aimed at developing fluency in the use of the grammatical constructions and vocabulary essential for everyday conversation. Prerequisite: RUS 003 or 006.
296. INDEPENDENT STUDIES (1-18)
297. SPECIAL TOPICS (1-9)

SCIENCE, TECHNOLOGY, AND SOCIETY (S T S)

100. THE ASCENT OF HUMANITY (3:3:0) A survey of some of the intellectual achievements that highlight mankind's attempts to understand nature and shape the environment.
105. (GHS) [FD SC 105 (GHS)] FOOD FACTS AND FADS (3:3:0) Impact on society and the individual of modern food technology, food laws, additives, etc.; historical, current, and futuristic aspects.

SERBO-CROATIAN (S CR)

- 001–2–3. BEGINNING SERBO-CROATIAN (4:3:2 each) An elementary course to enable the student to achieve a measure of proficiency in reading and speaking Serbo-Croatian.

SLAVIC (SLAV)

187. SLAVIC FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a Liberal Arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
296. INDEPENDENT STUDIES (1–19)

SOCIAL SCIENCE (SO SC)

001. (DS) URBANIZATION (3:3:0) An overview of the social sciences, including an interdisciplinary analysis of the urban process.
002. CONTEMPORARY SOCIETY (3:3:0) Selected contemporary issues in the perspective of history, sociology, psychology, economics, and political science.
110. (DS) INTRODUCTION TO CONTEMPORARY AFRICA (3:3:0) Consideration of influences and forces at work; leaders, elites, and groups. Analysis of problems and issues in Africa.
297. SPECIAL TOPICS (1–9)

SOCIAL WORK (SOC W)

250. (DS) INTRODUCTION TO SOCIAL WORK AND SOCIAL WELFARE (3:3:0) Origins and development of a "caring" philosophy; public and private social welfare programs; social work roles in a changing society. Prerequisite: sophomore standing.

SOCIOLOGY (SOC)

- * 001. (GS) INTRODUCTORY SOCIOLOGY (3:3:0) The nature and characteristics of human societies and social life.
- 003. (GS) INTRODUCTORY SOCIAL PSYCHOLOGY (3:3:0) The impact of the social environment on perception, attitudes, and behavior.
- 005. (GS) SOCIAL PROBLEMS (3:3:0) Current social problems such as economic, racial, and gender inequalities; social deviance and crime; population, environmental, energy, and health problems.
- 007. INTRODUCTION TO SOCIAL RESEARCH (3:3:0) Fundamental concepts and problems in social science research; design, measurement, sampling, causation, validity, interpretation. Prerequisite: 3 credits in sociology.
- 012. (DS) CRIMINOLOGY (3:3:0) Explanations and measurement of crime; criminal law; characteristics of criminals and victims; violent, property, white-collar, organized, and sexual crimes.
- 013. (DS) JUVENILE DELINQUENCY (3:3:0) Juvenile conduct, causes of delinquency, current methods of treatment; organization and function of agencies concerned with delinquency.
- 015. (DS) URBAN SOCIOLOGY (3:3:0) City growth and decline; impact of city life on individuals, families, neighborhoods, and government; urban life-styles.
- 023. (DS) POPULATION AND POLICY ISSUES (3:3:0) Local, national, and international population trends; basic techniques of demographic analysis; population problems; implications for public planning and policy.
- † 030. (GS) SOCIOLOGY OF THE FAMILY (3:3:0) Family structure and interaction; functions of the family as an institution; cross-cultural comparisons.
- 047. (S T S 047) WILDERNESS, TECHNOLOGY, AND SOCIETY (3:3:0) Impact of developments in science, literature, and art on changing attitudes toward nature; consequences for conservation, preservation, environmental ethics.
- 055. (DS) WORK IN MODERN SOCIETY (3:3:0) The nature of work in varied occupational and organizational settings; current trends and work life in the future.
- 110. (DS) [WMNST 110(DS)] THE SOCIOLOGY OF SEX ROLES (3:3:0) Changing sex role expectations and behavior for men and women in contemporary society.
- 119. (DS) RACE AND ETHNIC RELATIONS (3:3:0) Historical patterns and current status of racial and ethnic groups; inequality, competition, and conflict; social movements; government policy.

SPANISH (SPAN)

- 001. ELEMENTARY SPANISH I (4:3:2) Audio-lingual approach to basic Spanish; writing. Students who have received high school credit for two or more years of Spanish may not schedule this course for credit without permission of the department.
- 002. ELEMENTARY SPANISH II (4:3:2) Audio-lingual approach to basic Spanish continued; writing. Students who have received high school credit for four years of Spanish may not schedule this course for credit without permission of the department. Prerequisite: SPAN 001.
- 003. INTERMEDIATE SPANISH (4:3:2) Audio-lingual review of structure; writing; reading. Prerequisite: SPAN 002.
- 010. INTENSIVE SPANISH (6:5:2) Basic Spanish grammar; oral, aural, and writing skills. This course is essentially equivalent to SPAN 001, and first half of SPAN 002.
- 020. INTENSIVE SPANISH (6:5:2) Basic and intermediate Spanish grammar, oral, aural, and writing skills. This course is essentially equivalent to the second half of SPAN 002 and all of SPAN 003.
- 130. (GH) IBERIAN CIVILIZATION (3:3:0) Spanish and Portuguese life from the medieval period to the present; literature, the arts, and contemporary problems in historical perspective.
- 131. (GH) IBERO-AMERICAN CIVILIZATION (3:3:0) Spanish American and Brazilian life from the Conquest to the present: literature, art, the indigenous heritage, and contemporary problems.
- 230. (DH) MASTERPIECES OF SPANISH LITERATURE IN ENGLISH TRANSLATION (3:3:0) Emphasis on works and authors of international importance. Lectures, readings, and written work in English.
- 231. (DH) MASTERPIECES OF SPANISH AMERICAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Emphasis on works and authors of international importance. Lectures, readings, and written work in English.

*Students may take only one course for General Education credit from R SOC 011 GS or SOC 001 GS.

†Students may take only one course for General Education credit from HD FS 129 GS or SOC 030 GS.

SPEECH COMMUNICATION (SPCOM)

100. (GWS) EFFECTIVE SPEECH (3:3:0) Introduction to speech communication: formal speaking, group discussion, analysis and evaluation of messages.

Unit A. Principles of communication, implemented through presentation of speeches, with some attention to group discussion and message evaluation.

Unit B. Principles of communication, implemented through group problem solving, with some attention to formal speaking and message evaluation.

Unit C. Principles of communication, implemented through analysis and evaluation of messages, with some attention to formal speaking and group discussion.

STATISTICS (STAT)

100. (GQ) STATISTICAL CONCEPTS AND REASONING (3:3:0) Introduction to the art and science of decision making in the presence of uncertainty.

200. (GQ) ELEMENTARY STATISTICS (4:3:2) Descriptive statistics, frequency distributions, probability, binomial and normal distributions, statistical inference, linear regression, and correlation. Prerequisite: 2 units in algebra.

250. (GQ) INTRODUCTION TO BIOSTATISTICS (3:3:0) Statistical analysis and interpretation of data in the biological sciences; probability; distributions; statistical inference for one- and two-sample problems. Prerequisite: MATH 017 or 3 credits of calculus.

301. (GQ) STATISTICAL ANALYSIS I (3:3:0) Probability concepts; nature of statistical methods; elementary distribution and sampling theory; fundamental ideas relative to estimation and testing hypotheses. Prerequisite: 3 credits of calculus.

318. ELEMENTARY PROBABILITY (3:3:0) Combinatorial analysis, axioms of probability, conditional probability and independence, discrete and continuous random variables, expectation, limit theorems, additional topics. Students who have passed either STAT (MATH) 414 or 418 may not schedule this course for credit. Prerequisite: MATH 141.

TELECOMMUNICATIONS (TELCM)

140. INTRODUCTION TO TELECOMMUNICATIONS SYSTEMS (2:2:0) Elements of telecommunications systems, including telephones, transmission lines, switching, digital data, and transmission by microwave, satellite, and fiber optics.

241. SWITCHING AND TRAFFIC (3:3:0) Routing of telecommunications messages: characteristics, methods, and control. Prerequisite: TELCM 140.

242. INTRODUCTION TO TELECOMMUNICATIONS LABORATORY (1:0:2) Techniques used for measurements of basic telecommunications circuits and equipment. Prerequisite or concurrent: TELCM 241.

243. TRANSMISSION (3:3:0) Transmission of telecommunications information, including design problems. Prerequisite: TELCM 140.

244. ADVANCED TELECOMMUNICATIONS LABORATORY (1:0:2) Testing and measurement of advanced telecommunication transmission and switching equipment, including practical alignment and testing of operational systems. Prerequisite or concurrent: TELCM 243.

THEATRE ARTS (THEA)

100. (GA) THE ART OF THE THEATRE (3:3:0) Survey of the history, craft, and art of the theatre to support an informed appreciation of theatrical events.

102. (DA) FUNDAMENTALS OF ACTING (3:3:0) Introduction to performance skills for the student with a general interest in acting.

103. FUNDAMENTALS OF DIRECTING (3:3:0) Training and experience in basic skills of directing. Designed for non-Theatre majors.

104. FUNDAMENTALS OF THEATRE PRODUCTION (3:3:0) Training and experience in basic skills of technical theatre. Designed for non-Theatre majors.

109. (DA) THE DRAMATIC ARTS IN THE MASS MEDIA (3:3:0) The place of television-radio-film drama in our culture; relationship with other art forms; standards of evaluation.

WILDLIFE

- 160. INTRODUCTION TO COSTUME CRAFTS (2:1:2) Process of costuming combined with laboratory projects. Crew experience on major production.
- 170. INTRODUCTION TO STAGE LIGHTING PRODUCTION TECHNIQUES (2:1:2) Introduction to theatre lighting facilities, equipment, and practice. Practical experience with a major production.
- 180. INTRODUCTION TO STAGECRAFT (2:2:1) Introduction to methods, materials, and equipment used in scenic construction for the theatre. Practical experience with major production.
- 210. INTRODUCTION TO CREATIVE DRAMATICS (3:1:4) Introduction and direct experience in creative dramatics and survey of children's theatre.
- 296. INDEPENDENT STUDIES (1-18)

WILDLIFE (WILDL)

- 101. INTRODUCTION TO WILDLIFE MANAGEMENT (3:3:0) Basic principles of wildlife management. Introduction to general ecology and wildlife population dynamics.
- 103. ANIMAL IDENTIFICATION (3:2:3) Identification of mammals, birds, reptiles, and amphibians; introduction to their life histories.
- 106. WILDLIFE MANAGEMENT TECHNIQUES (4:3:3) Overview of laboratory and field techniques for natural resource research and management; scientific writing and computer applications emphasized.
- 204. WILDLIFE MENSURATION (4:4:0) Estimation and analysis of animal populations and their habitats, including sampling considerations and basic biometry. Prerequisite: 3 credits in mathematics.
- 207. OUTDOOR RECREATION (3:2:3) Sociology, history, and economics of recreational demand; recreational areas and management procedures.
- 208. TERRESTRIAL WILDLIFE MANAGEMENT (3:2:4) Ecological characteristics and manipulation of terrestrial habitats; control of wildlife populations. Prerequisites: FOR 240, 250, WILDL 101, 103, 106.
- 209. ANIMAL HANDLING AND CARE (4:3:3) Techniques in capturing, marking, and maintaining wild animals in captivity. Wildlife physiology, parasitology, and necropsy procedures are covered. Prerequisite: WILDL 101.
- 211. AERIAL PHOTO INTERPRETATION (4:2:6) Techniques of photo interpretation; type mapping of wildlife environments; photo censusing of wild animals.
- 213. WETLAND AND FISHERIES MANAGEMENT (3:3:3) Introduction to basic limnology. Ecology and management of swamp, marsh, pond, and stream habitats and their animal populations. Prerequisites: WILDL 101, 103, 106, 204.

WOMEN'S STUDIES (WMNST)

- 001. (GS) INTRODUCTION TO WOMEN'S STUDIES (3:3:0) Interdisciplinary consideration of the scholarly theories and research pertaining to women's experiences and women's status in contemporary American society.
- 110. (DS) [SOC 110(DS)] THE SOCIOLOGY OF SEX ROLES (3:3:0) Changing sex role expectations and behavior for men and women in contemporary society.
- 205. (COMM 205) WOMEN, MINORITIES, AND THE MEDIA (3:3:0) Analysis of historical, economic, legal, political, and social implications of the relationship between women, minorities, and the mass media.

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STATEMENT OF NONDISCRIMINATION

The Pennsylvania State University is committed to the policy that all persons shall have equal access to programs, facilities, admission, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state or federal authorities. The Pennsylvania State University does not discriminate against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, or veteran status. Direct all affirmative action inquiries to the Affirmative Action Office, The Pennsylvania State University, 201 Willard Building, University Park, PA 16802-2801.

REGULATIONS SUBJECT TO CHANGE

The educational process necessitates change. This bulletin must be considered as informational and not binding on the University.

Each step of the educational process, from admission through graduation, requires continuing review and appropriate approval by University officials. The University, therefore, reserves the right to change the requirements and regulations contained in this bulletin and to determine whether a student has satisfactorily met its requirements for admission or graduation, and to reject any applicant for any reason the University determines to be material to the applicant's qualifications to pursue higher education. Nothing in this bulletin should be considered a guarantee that completion of a program and graduation from the University will result in employment.

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UNIVERSITY CALENDAR*

SPRING SEMESTER 1993

JANUARY

- 6 Wednesday—Arrival day
- 8 Friday—Registration deadline
- 11 Monday—Classes begin

MARCH

- 8–12 Spring holiday, no classes

APRIL

- 30 Friday—Classes end

MAY

- 1, 2 Saturday, Sunday—Study days
- 3–8 Monday to Saturday—Final examinations
- 15, 16 Saturday, Sunday—Spring commencement

SUMMER SESSION 1993

Intercession

MAY

- 10 Monday—Classes begin
- 31 Monday—Memorial Day holiday, no classes

JUNE

- 4 Friday—Classes end

Eight-Week Session

JUNE

- 6 Sunday—Arrival day
- 8 Tuesday—Registration deadline
- 9 Wednesday—Classes begin

JULY

- 5 Monday—Independence Day holiday, no classes#

AUGUST

- 4 Wednesday—Classes end
- 5–7 Thursday to Saturday—Final examinations
- 14 Saturday—Summer commencement

Six-Week Session

JUNE

- 23 Wednesday—Classes begin

AUGUST

- 4 Wednesday—Classes end
- 5–7 Thursday to Saturday—Final examinations

*This calendar is subject to change without notice. Although the University makes every effort to avoid conflicts with religious holidays in preparing the calendar for an academic year, such conflicts are sometimes unavoidable. When they occur, efforts are made to make special arrangements for the students affected.

#Classes that would have met on Monday, July 5, 1993, will meet on Wednesday, August 4, 1993.

FALL SEMESTER 1993

AUGUST

- 21 Saturday—Arrival day for new students
- 22 Sunday—Arrival day for returning students
- 24 Tuesday—Registration deadline
- 25 Wednesday—Classes begin

SEPTEMBER

- 6 Monday—Labor Day holiday, no classes[†]

NOVEMBER

- 25–28 Thursday to Sunday—Thanksgiving holiday, no classes

DECEMBER

- 10 Friday—Classes end
- 11, 12 Saturday, Sunday—Study days
- 13–18 Monday to Saturday—Final examinations

JANUARY 1994

- 8 Saturday—Fall commencement

SPRING SEMESTER 1994

JANUARY

- 5 Wednesday—Arrival day
- 7 Friday—Registration deadline
- 10 Monday—Classes begin

MARCH

- 7–11 Spring holiday, no classes

APRIL

- 29 Friday—Classes end
- 30 Saturday—Study day

MAY

- 1 Sunday—Study day
- 2–7 Monday to Saturday—Final examinations
- 14, 15 Saturday, Sunday—Spring commencement

SUMMER SESSION 1994

Intercession

MAY

- 9 Monday—Classes begin
- 30 Monday—Memorial Day holiday, no classes

JUNE

- 3 Friday—Classes end

Eight-Week Session

JUNE

- 5 Sunday—Arrival day
- 7 Tuesday—Registration deadline
- 8 Wednesday—Classes begin

JULY

- 4 Monday—Independence Day holiday, no classes[†]

AUGUST

- 3 Wednesday—Classes end
- 4–6 Thursday to Saturday—Final examinations
- 13 Saturday—Summer commencement

Six-Week Session

JUNE

- 22 Wednesday—Classes begin

AUGUST

- 3 Wednesday—Classes end
- 4–6 Thursday to Saturday—Final examinations

[†]Classes that would have met on Monday, September 6, 1993, will meet on Wednesday, December 8, 1993.

[†]Classes that would have met on Monday, July 4, 1994, will meet on Wednesday, August 3, 1994.

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|--------|--------------------|-------|-----------------|--------|---------|----------|----------------------------|------------|-----------|----------------|--------|------------|----------|-----------------|--------------|----------------------|------|---|
| • | • | • | • | • | • | • | | • | • | • | • | • | • | • | • | • | • | Agricultural Business (1) |
| | | | | | • | | | | | | | | | | | • | | Architectural Engineering Technology |
| • | • | • | | • | • | • | | • | | • | • | • | | | | • | • | Biomedical Equipment Technology (2) |
| • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | Business Administration† |
| • | • | • | | • | • | • | | • | | • | • | • | | | • | • | • | Computer Engineering Technology (5) (7) |
| | | | | | | | | | | | | • | | | | • | | Computer Science |
| | | | | | | | | | | | | | | • | | | | Dietetic Food Systems Management# |
| • | • | • | | • | • | • | | • | | • | • | • | | | • | • | • | Electrical Engineering Technology |
| | | | | | | | | | • | | | | | | | | | Forest Technology |
| • | | • | | | | | | | | | | | | | | | | Hotel, Restaurant, and Institutional Management |
| | | | | • | | | | | | | | • | • | | | | | Human Development and Family Studies* |
| • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | Letters, Arts and Sciences* |
| • | • | • | • | • | • | • | | • | | • | • | • | | | • | • | • | Materials Engineering Technology (3) |
| • | • | • | • | • | • | • | | • | | • | • | | • | | • | • | • | Mechanical Engineering Technology |
| | | | | • | | • | | | | • | | | • | | | | | Medical Laboratory Technology (4) |
| | | | | | | | | | • | | | | | | | • | | Nursing |
| | | • | | | | | | | • | | | | | | | | | Occupational Therapy |
| | | | | | | • | | | • | | | | | | | | | Physical Therapist Assistance |
| • | • | | | • | | | | • | | • | | | • | | | | | Science—Biotechnology Option |
| | | | | | | | • | | | | | | | | | | | Science—General Option |
| | | | | | | | | | | • | | • | | | | | | Science—Radiologic Technologist Radiographer Option |
| | | | | | | • | | | | | | | • | • | | | | Sociology* |
| | | | | | | | | | | | | | | | • | | | Surveying Technology |
| • | • | • | | • | • | • | | • | • | • | • | • | | | • | • | • | Telecommunications Technology (6) |
| | | | | • | | | | | | | | | | | | | | Wildlife Technology |

- 1) Second year offered only at University Park.
- 2) Second year offered only at New Kensington and Wilkes-Barre.
- 3) Second year offered only at DuBois.
- 4) Second year offered only at Hazleton and New Kensington.
Admission to this program is highly competitive.
- 5) Second year offered only at McKeesport, New Kensington, Schuylkill, and Worthington Scranton.
- 6) Second year offered only at Delaware County, McKeesport, and Wilkes-Barre.
- 7) This program is not currently being offered to entering students.

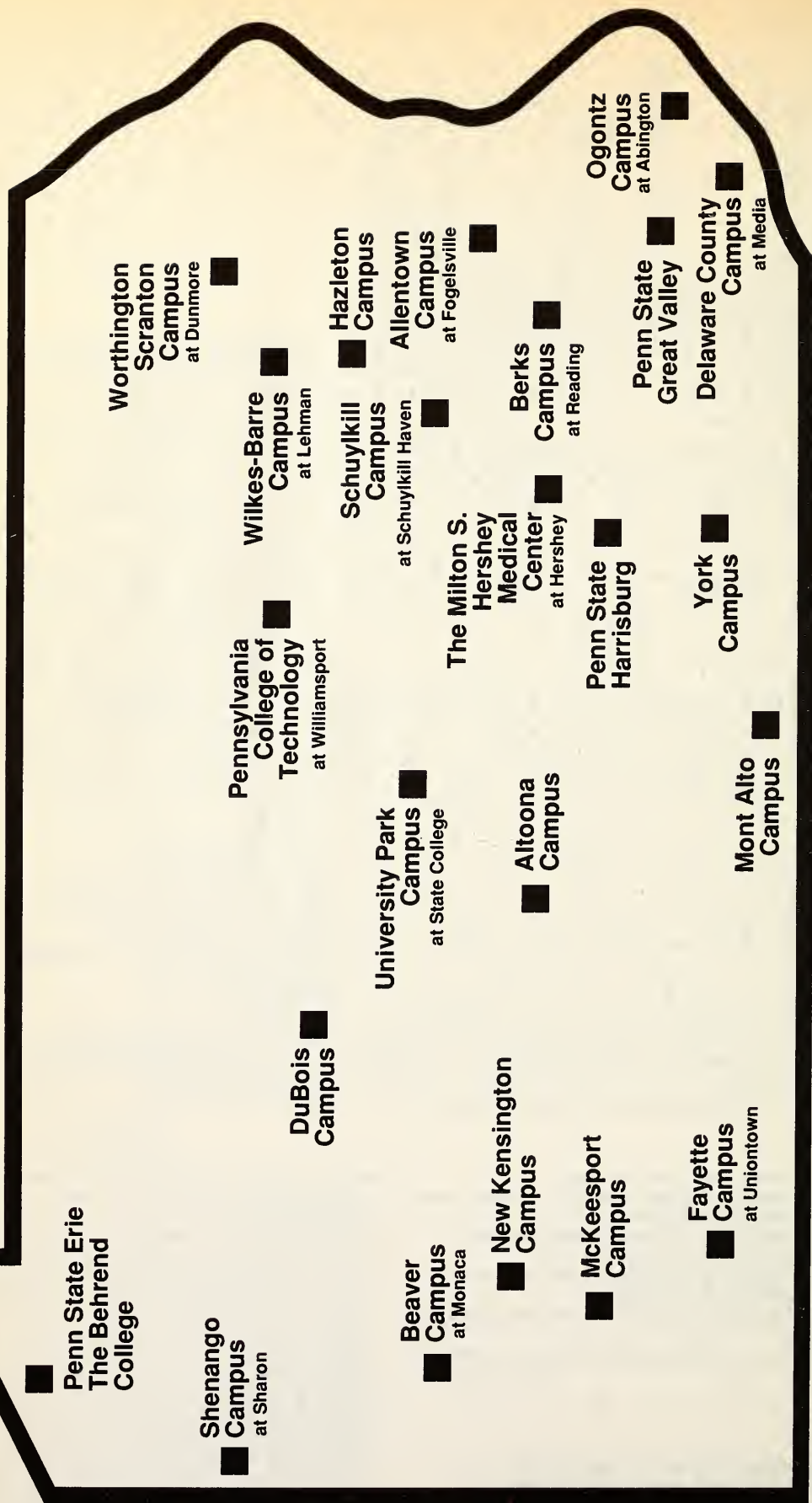
††Programs offered at the Medical Center are intended primarily for nontraditional students who want to pursue part-time (primarily evening) study. Interested students should write to Penn State Harrisburg, Continuing Education Credit Program, 777 W. Harrisburg Pike, Middletown, PA 17057-4898.

*Human Development and Family Studies and Sociology are offered as extended degree programs for students who want to pursue part-time (day or evening) study. Letters, Arts, and Sciences also may be taken as an extended degree program at all University locations. Interested students should write to the Admissions Office or the nearest Penn State campus to request a special application for extended degree programs.

#This program is available primarily through the Department of Independent Learning. Interested students should write to the Undergraduate Admissions Office at University Park, the Continuing Education office at the nearest Penn State campus, or the Department of Independent Learning, The Pennsylvania State University, 128 Mitchell Building, University Park, PA 16802-3600 for more information and to request a special application for extended degree programs.

The two-year Business Administration major offered at Penn State-Behrend, The Milton S. Hershey Medical Center, Ogontz, and University Park is intended for nontraditional students who want to pursue part-time (primarily evening) study.

Penn State locations



THE UNIVERSITY

MISSION OF THE UNIVERSITY

The Pennsylvania State University, a major multicampus institution serving all regions of the Commonwealth, is devoted to learning and service enlightened by vigorous research and scholarship. As a land-grant university, Penn State provides high-quality teaching in a wide array of undergraduate and graduate programs in the arts, humanities, and sciences, as well as in a balanced offering of programs in professional and technical disciplines. As the preeminent institution of higher education in Pennsylvania, and as one of the leading research universities of the nation and the world, Penn State accepts the dual responsibility to excel and to serve both the public and private sectors of our society.

Penn State shares three traditional responsibilities with other major universities:

—*Education.* Penn State strives to create new dimensions in the lives of its students by introducing them to the collective knowledge, wisdom, and experience of human society, by encouraging them to acquire the skills and intellectual discipline to comprehend the complexities of our times, and by motivating them to consider the values and aspirations that will guide their future.

—*Research.* Penn State strives to broaden human horizons by promoting scholarship, creativity, and the advancement of knowledge, thus enhancing our understanding of ourselves and the many worlds around us.

—*Service.* Penn State strives to contribute to economic and societal vitality by offering informed views on critical and recurring issues, by providing opportunities for cultural and intellectual enrichment, and by contributing new ideas and new techniques to advance both private and public endeavors.

The University encourages the interplay of individual creativity and intellectual diversity as the source of true understanding; it cultivates appreciation of human capabilities and human diversity as the pathway to individual and societal achievement and self-esteem. Penn State is thus committed to creating and maintaining an intellectual and an educational environment that reflects diverse values and needs; it fosters appreciation of a multicultural human society and seeks greater involvement with our increasingly interdependent world.

Penn State is a single university with many campuses, many strengths, and many ambitions. It is uniquely qualified to provide academic programs, continuing education, and public service and economic development programs that enhance the well-being of all citizens of the Commonwealth.

RESERVATIONS

The University reserves the right to make such program or class changes as may become necessary because of insufficient enrollment or other contingencies. The University also reserves the right to make any necessary changes in tuition and charges without prior notice. Courses and programs described in this bulletin also are subject to change without notice.

RESIDENT INSTRUCTION

The undergraduate degree programs of the University provide students with opportunities to increase their knowledge and understanding of the world, and to grow in their individual skills and capabilities for learning, analyzing, judging, creating, and communicating. All undergraduate degree programs and courses offered by the colleges and other degree-granting units of the University are under the academic sponsorship of a faculty committed to scholarship and are implemented under the academic policies and student rules established by the University Faculty Senate. They are intended to be flexible in accommodating students interested in learning, whether through traditional or nontraditional offerings, while enrolled on either a part-time or a full-time basis. The degree

programs and courses of the colleges and other degree-granting units are offered through University administrative arrangements identified as Resident Instruction and Continuing Education. The primary mission of Resident Instruction is to provide credit courses to degree candidates on University campuses as well as to administer certain off-campus credit-granting activities such as internships, practicums, field trips, and foreign studies. Students not formally admitted to degree candidacy (including provisional and nondegree students) may participate in Resident Instruction offerings as time and space permit.

HISTORY

THE PENNSYLVANIA STATE UNIVERSITY, chartered by the Pennsylvania Legislature as the Farmers' High School in 1855, was founded by professional men, educated farmers, and state and county agricultural leaders. A faculty of four met the incoming class of sixty-nine students in February 1859.

In May 1862, the institution was renamed the Agriculture College of Pennsylvania, a name that recognized that its work was of collegiate level. Two months later, on July 2, President Abraham Lincoln signed the Morrill Land Grant Act, offering each state free public land that it could sell to endow institutions of higher learning where "the leading object shall be to teach such branches of learning as are related to agriculture and the mechanic arts . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

On April 1, 1863, the state legislature declared that the Morrill Act "is hereby accepted by the State of Pennsylvania with all its provisions and conditions and the faith of the State is hereby pledged to carry the same into effect." The legislature then designated Penn State as the land-grant college of the Commonwealth.

The college broadened the scope of its instruction, began to admit female students, increase its enrollment, and enlarge its physical plant. Graduate work was offered as early as 1862. In 1874, the college was renamed the Pennsylvania State College.

In 1953, the name was changed again—to The Pennsylvania State University—in formal recognition of what Penn State had long since become, one of the country's leading universities. Its nine undergraduate colleges and the School of Communications now offer 141 baccalaureate and 25 associate degree majors. Penn State Erie, The Behrend College, offers 21 complete baccalaureate programs. Penn State Harrisburg offers 30 baccalaureate degree majors. Graduate students may choose from 150 approved fields of study. The College of Medicine at The Milton S. Hershey Medical Center in Hershey offers the M.D. degree, the M.S. and Ph.D. in anatomy, bioengineering, biological chemistry, cell and molecular biology, genetics, microbiology and immunology, neuroscience, pharmacology, and physiology, and the M.S. degree in laboratory animal medicine.

The original student body of 69 has grown to 70,576, the faculty of four to 5,009. Beginning with an educational program that offered 40 courses, Penn State today offers 5,545 undergraduate, 3,488 graduate courses, and 176 medical courses. The University, whose prime purpose has always been to serve the people and the interests of the Commonwealth and the nation, is accredited by the Middle States Association and is a member of the Association of American Universities.

ACADEMIC ORGANIZATION OF THE UNIVERSITY

COLLEGES AND OTHER DEGREE-GRANTING UNITS

The University has nine colleges and one school that offer undergraduate majors leading to baccalaureate and associate degrees: College of Agricultural Sciences, College of Arts and Architecture, The Mary Jean and Frank P. Smeal College of Business Administration, College of Earth and Mineral Sciences, College of Education, College of Engineering, College of Health and Human Development, College of the Liberal Arts, Eberly College of Science, and the School of Communications. Penn State Erie, The Behrend College, and Penn State Harrisburg provide alternative educational settings in which students may enroll in selected degree programs.

THE COMMONWEALTH EDUCATIONAL SYSTEM

THE COMMONWEALTH EDUCATIONAL SYSTEM—CES is composed of the seventeen Commonwealth Campuses and Penn State Great Valley.

COMMONWEALTH CAMPUSES—Full-time instruction and continuing education are available at the Commonwealth Campuses: Allentown (Fogelsville); Altoona; Beaver (Monaca); Berks (Reading); Delaware County (Media); DuBois; Fayette (Uniontown); Hazleton; McKeesport; Mont Alto; New Kensington; Ogontz (Abington); Schuylkill (Schuylkill Haven); Worthington Scranton (Dunmore); Shenango (Sharon); Wilkes-Barre (Lehman); and York.

PENN STATE GREAT VALLEY—Graduate programs in education, engineering, and management are available at Penn State Great Valley along with an array of continuing education programs.

TWO-YEAR ASSOCIATE DEGREE MAJORS

Majors that lead to two-year associate degrees are available at Penn State-Behrend and all of the University's Commonwealth Campuses except Allentown, as listed previously in this bulletin. These majors provide concentrated instruction to prepare graduates for specialized occupational assignments, except for the Letters, Arts, and Sciences major, which provides graduates with a general education and some specialization in their fields of interest. In addition, a major in Dietetic Food Systems Management is available primarily through the Department of Independent Learning.

More than twenty associate degree majors lead to either the Associate in Arts degree, the Associate in Engineering Technology* degree, or the Associate in Science degree. The majors leading to these degrees are listed here.

Associate in Arts Degree

Letters, Arts, and Sciences

Sociology

Associate in Engineering Technology Degree

Architectural Engineering Technology⁺

Biomedical Equipment Technology⁺

Building Energy Systems Technology⁺

Computer Engineering Technology⁺⁺⁺

Electrical Engineering Technology⁺

Materials Engineering Technology

Mechanical Engineering Technology⁺

Nuclear Engineering Technology⁺

Surveying Technology⁺

Telecommunications Technology⁺⁺

Associate in Science Degree

Agricultural Business

Business Administration

Computer Science

Dietetic Food Systems Management

Forest Technology

Hotel, Restaurant, and Institutional

Management

Human Development and Family Studies

Medical Laboratory Technology

Nursing

Occupational Therapy

Physical Therapist Assistance

Science—Biotechnology

Science—General

Science—Radiologic Technologist

Radiographer Option

Wildlife Technology

A description of the purposes, objectives, and content of each two-year major is given in the MAJORS section of this bulletin.

Most of Penn State's associate degree enrollment at present is concentrated in its engineering technology majors. Programs that are accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC of ABET) are indicated. Accreditation applies to each program at campuses where both years of that program are taught. Engineering technology is a profession in which a knowledge of mathematics and natural sciences gained through higher education, experience, and practice is devoted primarily to the implementa-

* School of Engineering Technology and Commonwealth Engineering

+ Accredited by TAC of ABET at all locations offering the full two years of the program.

++ Accredited by TAC of ABET at Wilkes-Barre Campus.

+++ Accredited by TAC of ABET at Schuylkill Campus.

tion and extension of existing technology for the benefit of humanity. Engineering technology education focuses primarily on the applied aspects of science and engineering aimed at preparing graduates for practice in that portion of the technological spectrum closest to product improvement, industrial processes, and engineering operational functions.

ADMISSION

STATEMENT OF BASIC ACADEMIC ADMISSION POLICIES—Admission to University credit courses or degree candidacy at The Pennsylvania State University is governed by policies established by the University Faculty Senate. Although specific applications of these policies may vary from year to year, from location to location, and from program to program, all University admissions are governed by the following general policies:

1. As an institution of higher education, The Pennsylvania State University is committed to making post-high school education available to all who possess a high school diploma or its equivalent without restriction as to age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, or veteran status as provided by law.
2. The primary responsibility of the University is to residents of the Commonwealth of Pennsylvania. Consequently, within limits expressed from time to time by the Board of Trustees of the University, preference shall be given to Pennsylvania residents in the various admissions processes.
3. In order to meet the variety of goals and objectives of the population, the spectrum of offerings is designed to enable persons with a variety of objectives—both degree and nondegree—to receive a higher education. Although access to educational opportunities of the University is open to all, courses offered for credit are available to those holding a high school diploma or its equivalent. Policies governing admission to degree candidacy are established by the University Faculty Senate (with delegation of policies governing admissions to graduate programs to the Graduate Faculty of the University) under a general policy of offering admission to those whose past academic performance indicates a reasonable probability of success.
4. Undergraduate students are admitted to either baccalaureate degree candidacy or associate degree candidacy. To be admitted to degree candidacy, the individual must present an academic performance record that indicates a reasonable probability of his or her success in his or her chosen program. In the case of freshman admission to undergraduate degree candidacy, performance is measured through the high school record and standardized test results. In the case of advanced standing admission, performance is measured either through success in nondegree programs and courses of the University or by success at some other institution of higher education.
5. Within the space available in particular programs and at particular locations, admission shall be offered preferentially to those whose performance record indicates the highest probability of success in the chosen program—with this process continuing until all available spaces are filled. Although exceptions to this policy may be made from time to time (for example, recipients of scholarships with restricting qualifications), these exceptions may be made only for students who meet at least the minimum admission and entrance requirements.
6. If a college or school requires restrictions on its baccalaureate admissions, the priorities or targets established must include provisions to consider qualified students in each of these groups:
Admissions Group I—Freshman Admissions: Students who hold a high school diploma or equivalent, who present fewer than 18 credits of baccalaureate work (from The Pennsylvania State University or another regionally accredited institution), who meet minimum college or school entrance requirements, and who meet minimum college or school admission standards.
Admissions Group II—The Pennsylvania State University Advanced Standing Admissions: Students who (1) request baccalaureate degree readmission, presenting 18 or more credits; (2) request a change from The Pennsylvania State University associate degree to baccalaureate

degree status, presenting 18 or more applicable credits; (3) request a change for The Pennsylvania State University provisional degree to baccalaureate degree status, presenting 18 or more applicable credits; or (4) request changes from The Pennsylvania State University nondegree to baccalaureate degree status presenting 18 or more applicable credits. In all advanced standing admissions at The Pennsylvania State University, the student must have a grade-point average of at least 2.00 and must meet the minimum entrance and advanced standing requirements of the college or school. However, a student who has had an interruption in enrollment at Penn State of no fewer than four calendar years and whose cumulative grade-point average is less than 2.00 may petition for readmission with academic renewal in accordance with Senate Policy 57-00.

Admissions Group III—Other Advanced Standing Admissions: Students who have not been students at Penn State and request baccalaureate degree status at Penn State, presenting 18 or more applicable credits from a regionally accredited institution. In all advanced standing admissions it is understood that the student must have a grade-point average of 2.00 as computed at Penn State and meet the minimum entrance and advanced standing requirements of the college or school. However, a student who has not met the entrance requirements or achieved a grade-point average of 2.00 (on a 4.00 scale) for all graded courses taken at all institutions previously attended, and who has had a four-calendar-year absence from the institution(s), may apply to enroll in credit courses as a provisional student in accordance with Senate Policy 10-00. A student who has had an absence from the institution(s) of fewer than four calendar years, and has not met the entrance requirements or has achieved a grade-point average of less than 2.00, may apply to enroll in credit courses as a nondegree student in accordance with Senate Policy 14-00.

Within these three groups, no special consideration will be given to any group; students will be admitted to the college or school on the basis of academic competition (e.g., SAT scores, grade-point averages, grades in required courses in the college or school, and other evidence predictive of baccalaureate degree performance where available, valid, and reliable).

7. To ensure a proper educational mix of students and to further broaden the educational opportunities offered by the University, the University Faculty Senate and the University administration from time to time may authorize various specialized programs. These programs may permit students who do not meet the basic qualifications for admission to degree candidacy to be admitted to such candidacy. These programs may also permit, in selected situations, exceptional students who have not earned a high school diploma or its equivalent to enroll in University credit courses. Such specialized programs may include up to 10 percent of the total admission group for the University in any one year and up to the maximum of 15 percent of the admission to any geographic location of the University.
8. Within this general policy, the colleges and school of the University, with the concurrence of the University Faculty Senate, may impose certain educational background requirements (Carnegie Units) that must be completed by an individual before being admitted to degree candidacy.

MINIMUM REQUIREMENTS FOR ADMISSION TO DEGREE CANDIDACY—To be eligible for admission consideration to the University as a degree candidate, either as a beginning student or as a student with advanced standing, an applicant must meet the following minimum requirements:

1. Graduation from an accredited secondary school.
2. Completion of the required units of preparatory work as indicated under the heading of Minimum Secondary School Units Required for Admission Consideration in this bulletin.

A secondary school diploma issued by the Pennsylvania Department of Education, or appropriate authority in another state, may be accepted as equivalent to graduation from an accredited secondary school and as equivalent to the minimum secondary school units required for admission, as indicated under the Minimum Secondary School Units Required for Admission Consideration heading, with the exception of mathematics and foreign language.

The University accepts the definition of a secondary school unit as established by the Carnegie Foundation. A unit represents a year of work in a subject in a preparatory school or secondary

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school, provided that the work done in that subject is approximately one-fourth of the total amount of work regularly required in a year in the school.

The University reserves the right to deny admission to any applicant for any reason the University determines to be material to the applicant's qualifications to pursue higher education.

Admission to degree candidacy is specified in terms of enrollment in a college or school of the University or in the Division of Undergraduate Studies. Both for admission to a college or school and for entrance to a major, a student must satisfy the requirements of the University, of the particular college or school, and of the major area. In special circumstances, the University may need to further restrict admission to a college or school and entrance to majors because of space limitations.

MINIMUM SECONDARY SCHOOL UNITS REQUIRED FOR ADMISSION CONSIDERATION FOR ASSOCIATE DEGREE MAJORS

| | English | Math C* | Math D** | Math E*** | Science | Arts/Humanities/ Social Studies/ Foreign Languages |
|--|---------|---------|----------|-----------|---------|--|
| TWO-YEAR DEGREE MAJORS | | | | | | |
| Agricultural Business | 4 | | | 2 | 2 | 5 |
| Architectural Engineering Technology | 4 | 2 | | | 2 | 5 |
| Biomedical Equipment Technology | 4 | 2 | | | 2 | 5 |
| Building Energy Systems Technology | 4 | 2 | | | 2 | 5 |
| Business Administration (2-year) | 4 | | 2 | | 2 | 5 |
| Computer Engineering Technology | 4 | 2 | | | 2 | 5 |
| Computer Science (2-year) | 4 | 2 | | | 2 | 5 |
| Dietetic Food Systems Management | 4 | | | 2 | 2 | 5 |
| Electrical Engineering Technology | 4 | 2 | | | 2 | 5 |
| Forest Technology | 4 | | 2 | | 2 | 5 |
| Hotel, Restaurant, and Institutional Management (2-year) | 4 | | | 2 | 2 | 5 |
| Human Development and Family Studies | 4 | | | 2 | 2 | 5 |
| Letters, Arts, and Sciences | 4 | | | 2 | 2 | 5 |
| Materials Engineering Technology | 4 | 2 | | | 2 | 5 |
| Mechanical Engineering Technology | 4 | 2 | | | 2 | 5 |
| Medical Laboratory Technology | 4 | 2 | | | 2+ | 5 |
| Nuclear Engineering Technology | 4 | 2 | | | 2 | 5 |
| Nursing (2-year) | 4 | | 2 | | 2++ | 5 |
| Occupational Therapy | 4 | | | 2 | 2 | 5 |
| Physical Therapist Assistance | 4 | | 2 | | 2+++ | 5 |
| Science (2-year) (including Biotechnology and Radiologic Technologist Radiographer Options) | 4 | 2 | | | 2 | 5 |
| Sociology (2-year) | 4 | | | 2 | 2 | 5 |
| Surveying Technology | 4 | 2 | | | 2 | 5 |
| Telecommunications Technology | 4 | 2 | | | 2 | 5 |
| Wildlife Technology | 4 | | 2 | | 2 | 5 |

* Math C requirements may be satisfied by at least 2 units of mathematics: 1 unit of algebra and 1 additional unit in any combination of advanced algebra, plane geometry, solid geometry, or trigonometry.

** Math D requirements may be satisfied by at least 2 units of mathematics: 1 unit of algebra and 1 additional unit of mathematics. Plane geometry is recommended for Business Administration, Forest Technology, and Wildlife Technology.

*** Math E requirements may be satisfied by any 2 units of mathematics.

+ Students entering Medical Laboratory Technology should have 1 unit each in biology and chemistry.

++ Students entering Nursing are required to have 1 unit in biology and 1 unit in chemistry.

+++ Students entering Physical Therapist Assistance should have 1 unit in biology plus one other science course.

FRESHMAN ADMISSION—An applicant for admission as a beginning student in the freshman class must meet the minimum requirements for admission to degree candidacy as stated above prior to the time of matriculation. All offers of admission are conditional until these requirements have been met.

Each applicant is evaluated on the basis of the high school record and results of the Scholastic Aptitude Test (SAT) or American College Test (ACT). This evaluation produces an evaluation index. Admission decisions are made on the basis of a review of the applicant's evaluation index in relation to the requested area of enrollment (academic program), space availability, and the quality of the credentials presented by other applicants.

When openings at the requested location or in the requested program of the University are filled, qualified applicants will be offered admission to their alternate choice of program or location, or notified of campuses where openings still exist.

College Entrance Tests—All applicants for freshman admission to the University are required to submit scores of the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board or the American College Test (ACT). SAT or ACT results of the junior-year testing periods are recommended. The SAT is preferred.

Changing the Area of Enrollment—An applicant who has been admitted to an associate degree major may not change to another without satisfying entrance requirements of the college and major to which he or she wants to transfer.

Previous Attendance at Another College—An applicant must state on his or her application whether he or she has ever attended any other college or university. Failure to indicate, at the time of application, previous registration at another college or university may result in refusal or cancellation of admission. An applicant who has attempted fewer than 18 semester credits at another regionally accredited college or university will be considered as a freshman applicant. An applicant who has attempted 18 or more credits at another regionally accredited college or university subsequent to high school graduation will be evaluated as an advanced standing applicant.

Obtaining an Application—An application can be obtained from the Undergraduate Admissions Office, The Pennsylvania State University, 201 Shields Building, Box 3000, University Park, PA 16802-1294; (814) 865-5471, or from an admissions officer at any University location.

ADVANCED STANDING ADMISSION—An applicant who has attended any regionally accredited college or institution on the college level and attempted 18 or more semester credits subsequent to high school graduation may be considered for admission with advanced standing. Attendance at any other institution must be reported at the time of application. Failure to indicate, at the time of application, previous registration at another college or university may result in refusal or cancellation of admission.

An applicant for admission with advanced standing must meet the minimum secondary school requirements for admission to degree candidacy as stated above prior to the time of matriculation. Advanced standing applicants are considered for admission on the basis of the applicant's requested academic program, space availability, and the academic quality of their work at the previously attended institution(s). A minimum cumulative average of at least 2.00 (C) out of 4.00, as computed for Penn State students, is required, although certain areas of study may have additional requirements. In addition, an applicant must be in good academic and nonacademic standing. A student who has not met the entrance requirements or achieved a grade-point average of 2.00 (on a 4.00 scale) for all graded courses taken at all institutions previously attended, and who has had a four-calendar-year absence from the institution(s), may apply to enroll in credit courses as a provisional student in accordance with Senate Policy 10-00. A student who has had an absence from the institution(s) of fewer than four calendar years, and who has not met the entrance requirements or has achieved a grade-point average of less than 2.00, may apply to enroll in credit courses as a nondegree student in accordance with Senate Policy 14-00.

Advanced standing credits may be awarded for work taken at regionally accredited institutions provided the grade earned is equivalent to a grade of A, B, or C at this university, and the credits are useful to the student's program of study. An academic adviser determines which of the transferable credits are applicable to the program of study at Penn State. Credits are transferred, but grades and

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grade points are not. Advanced standing students enter the University without an average, and their average begins with the completion of their first semester of study at Penn State.

Associate degree programs have a limit on the number of credits that may be accepted by transfer from regionally accredited institutions. Information about credit limitations may be obtained from the academic official responsible for a particular program.

In certain circumstances, the University may need to restrict advanced standing admissions to particular programs because of space limitations.

Application Procedure—An application can be obtained from the Undergraduate Admissions Office, The Pennsylvania State University, 201 Shields Building, Box 3000, University Park, PA 16802-1294; (814) 865-5471, or from an admissions officer at any University location. In all cases where work has been taken at other institutions, an official transcript from each place of attendance must be submitted directly to the Undergraduate Admissions Office by the registrar of the institution attended. An applicant currently attending another institution also must provide a schedule of courses in progress or to be completed before enrollment at Penn State, including course name, number, description, and number of credits. The Undergraduate Admissions Office may require the student to send a catalog showing the courses that he or she has taken at the college previously attended. The applicant's secondary school record must be submitted directly to the Undergraduate Admissions Office by the school. All credentials become part of the permanent records of the University.

Changing the Major of Enrollment—An applicant who has been admitted to an associate degree major may not change to another without satisfying entrance requirements of the college and major to which he or she wants to transfer.

PROVISIONAL STUDENT (DEGREE-SEEKING)—An applicant seeking to pursue a degree program and holding a high school diploma or its equivalent but without the criteria required for admission as a degree candidate may enroll in credit courses at the University. A provisional student may enroll in credit courses if the following criteria are met:

1. The student is making satisfactory progress toward admission as a degree candidate. Progress is satisfactory if a student has completed 18 credits with a minimum cumulative grade-point average of 2.00 (on a 4.00 scale). If a student has completed 18 credits and earned less than a 2.00 cumulative grade-point average, the student is given a warning. A student who has completed 27 credits with a cumulative grade-point average of less than 2.00 will not be permitted to enroll as a provisional student in any subsequent semester, unless the student earned more than a 2.00 grade-point average in the most recently completed semester. No student, regardless of cumulative grade-point average, who has completed 36 credits will be permitted to enroll as a provisional student in any subsequent semester.
2. There is space available after degree candidates have been accommodated.
3. The student has not been dropped for unsatisfactory scholarship from any college or university previously attended.
4. The student has not been dismissed or suspended for nonacademic reasons from any college or university. An applicant not in good standing at another accredited college or university for disciplinary reasons must consult with the Director of the Office of Conduct Standards for admissions clearance.

Obtaining an Application—An application can be obtained from the Undergraduate Admissions Office, The Pennsylvania State University, 201 Shields Building, Box 3000, University Park, PA 16802-1294; (814) 865-5471, or from an admissions officer at any University location.

Admission of a Provisional Student as a Degree Candidate—A provisional student may apply for admission as an associate degree candidate after completing 9 credits of Penn State course work with a minimum cumulative grade-point average of 2.00. The applicant also must satisfy the entrance requirements of either the major in which enrollment is desired or of the Division of Undergraduate Studies if the student wishes to enroll in that division. An applicant who has com-

pleted at least the equivalent to one year of associate degree work before applying for admission as an associate degree candidate must have the approval of either the dean of the college or school in which enrollment is requested or of the director of the Division of Undergraduate Studies if the student wishes to enroll in that division. Under certain circumstances, the University may need to restrict admission to degree candidacy in a particular college, school, or major because of space limitations. Provisional students should work with their advisers and utilize current information about academic requirements and restrictions in planning their programs of study toward admission to degree candidacy. After a student is admitted as a degree candidate, the dean of the college or school of enrollment decides which credits earned as a provisional student may be used to fulfill the degree requirements.

NONDEGREE STUDENT—Any person having received a high school diploma or its equivalent may be permitted to enroll in credit courses (either for credit or audit) at the University. Some of these persons will be classified as nondegree students.

A nondegree student who has not been dropped from degree or provisional status by Penn State or any other college or university for unsatisfactory scholarship will be listed as a nondegree-regular student and may enroll in any number of credits not to exceed the typical credit load of a full-time student per semester if criteria 1, 2, and 3 (on the following list) are met.

A nondegree student who has been dropped from degree or provisional status by Penn State or any other college or university because of unsatisfactory scholarship will be listed as a nondegree-conditional student and may enroll in a maximum of 10 credits per semester if criteria 1, 2, 3, and 4 (on the following list) are met.

1. The student has completed the prerequisite for the courses to be scheduled or has obtained permission from the instructor to schedule the course.
2. Space is available after degree candidates and provisional students have been accommodated.
3. The student has not been dismissed or suspended for nonacademic reasons from any college or university. An applicant not in good standing at another college or university for disciplinary reasons must consult with the director of the Office of Conduct Standards for admission clearance.
4. The student has obtained academic advising/counseling from an adviser/counselor designated by the academic unit to which admission, or reinstatement and readmission, is desired.

Note: A student must be admitted, or reinstated and readmitted, as a degree candidate to apply the credits earned as a nondegree student toward fulfilling the requirements for a degree. The dean of the college or school of enrollment shall decide which credits may be used to fulfill the degree requirements.

Obtaining an Application—An application can be obtained from the Undergraduate Admissions Office, The Pennsylvania State University, 201 Shields Building, Box 3000, University Park, PA 16802-1294; (814) 865-5471, or from an admissions officer at any University location.

Admission of Nondegree Student as a Degree Candidate—A nondegree student may apply for admission as an associate degree candidate upon completion of at least 9 credits earned at Penn State with at least a 2.00 cumulative grade-point average. An applicant who has completed at least the equivalent of one year of associate degree work before applying for admission as an associate degree candidate must have the approval of the dean of the college or school in which enrollment is requested. To be eligible for degree admission, the nondegree student must meet the academic requirements of the University and the college or school in effect at the time of application. Under certain circumstances, the University may need to restrict admissions to degree candidacy or entrance to particular majors because of space limitations. After a student is admitted as a degree candidate, the dean of the college or school of enrollment decides which credits earned as a nondegree student may be used to fulfill degree requirements.

INFORMATION FOR NEW STUDENTS

The Office of Undergraduate Information and Communications provides freshmen as well as advanced standing and change-of-assignment students at University Park Campus with comprehensive information regarding the essential academic and student development opportunities of the campus and the University in general beginning with a new student's acceptance to a campus and continuing through completion of the new student's first semester.

Through programs offered in cooperation with the colleges' academic units and various student service operations, new students are introduced to the intellectual and scholarly expectations of the University, to the skills needed for advanced study and lifelong learning, and to the student development opportunities with academic merit. In addition, this office provides a series of communications designed to introduce the University, to inform students of the required procedures for matriculation, and to offer a perspective on college life. These communications also give new students practical information about important dates, times, and locations (e.g., arrival day, first day of classes, course drop/add, etc.).

Many programs for new students are scheduled during arrival week each semester. During this period, new students receive instruction and counseling concerning their courses of study and participate in extracurricular and cultural activities. Registration is also held during arrival week.

BASIC SKILLS

The Basic Skills Program consists of both academic services and courses designed to accommodate differences between high school preparation and the minimum college-level skills necessary for success in introductory University courses. The primary goal of this program is to provide academic support in writing, reading, mathematics, and other essential learning processes. Students may be identified for basic skills assistance via FTCAP placement scores or referral (self-, instructor, adviser, etc.).

Students with weaknesses in English composition are required to enroll in English 004 (3 credits) prior to scheduling English 015 (GWS;DEX). English 004 provides intensive practice in expository writing with instruction in the basic conventions of syntax and mechanics. A 1-credit tutorial, English 005, may be taken concurrently with English 004. Credits earned in English 004 and 005 do not substitute for minimum program requirements designated under the categories of "General Education," "Requirements for the Major," or "Electives."

Students with mathematics weaknesses are encouraged to strengthen these skills by reviewing the following topics: operations with rational numbers and decimals; applications involving ratio, proportion, and percent; factoring algebraic expressions; operations with polynomials; properties of exponents; solutions of linear equations and inequalities; operations with radical expressions; solution of quadratic equations and inequalities; graphing in the coordinate plane; and solutions of systems of equations. Credited courses are available to assist in the review of the topics. The credits earned in these courses may not be used for minimum program requirements for "General Education," "Requirements for the Major," or "Electives."

Assistance in reading is available through a series of college reading improvements courses. LL ED 005 focuses on the development of basic reading skills and their efficient application to college study. LL ED 010 involves incorporation of higher-level vocabulary, comprehension, and study skills in content area courses. Each course is offered for 3 credits and may be used to fulfill elective credits if program requirements in this category are not restricted by program, department, or college policy.

The Learning Center, a resource available at most campus locations, offers a variety of services. This facility and its resources are open to any student who needs or wants assistance in the basic skill areas of writing, reading, and mathematics. Other Learning Center services may include study skills development, subject area tutoring, supplemental instruction, and computer-assisted learning.

DIVISION OF UNDERGRADUATE STUDIES (DUS)

The Division of Undergraduate Studies is an academic unit of the University that offers at the Commonwealth Campuses; Penn State Erie, The Behrend College; and University Park Campus the following programs and services:

Freshman Testing, Counseling and Advising Program—New first-year students admitted to the University are provided with comprehensive testing, educational planning, and academic advising prior to attending first-semester classes. The purpose of the program is to provide all new students with assistance in evaluating their educational plans and objectives.

Enrollment Program—New first-year students who prefer to test their abilities and interests or who want to explore several areas of study before identifying themselves with one of the University's colleges may request to begin their enrollment in the Division of Undergraduate Studies. Other students who are enrolled in the University but who experience changes in interests or educational objectives, who discover new opportunities, or who want to gain a better perspective of their abilities may also seek enrollment in the division to facilitate a change to a new program of study.

Academic Advising Program—All students, whether or not they are enrolled in the Division of Undergraduate Studies, have available to them the professional advising, educational planning, and referral services provided by DUS. Such services are a supplement to and are coordinated with the advisory services of the colleges and other degree-granting units and faculty. Provisional students aspiring to degree programs are also served by this unit.

Academic Information Program—The Division of Undergraduate Studies provides a comprehensive academic information support system throughout the University to assist faculty in their student advisory responsibilities. Academic advising and information centers are located at each of the campuses in the Commonwealth Educational System and in the colleges and other degree-granting units of the University.

GRADING SYSTEM—The grades of A, B, C, D, and F indicate the following qualities of academic performance:

- A (EXCELLENT) Indicates exceptional achievement.
- B (GOOD) Indicates extensive achievement.
- C (SATISFACTORY) Indicates acceptable achievement.
- D (POOR) Indicates only minimal achievement. It indicates that the student may be seriously handicapped in carrying a more advanced course for which this course is a specific prerequisite.
- F (FAILURE) Indicates inadequate achievement necessitating a repetition of the course in order to secure credit.

The grades of A, A-, B+, B, B-, C+, C, D, and F indicate a gradation in quality from Excellent to Failure and are assigned the following grade-point equivalents:

| <i>Grade</i> | <i>Grade-Point Equivalent</i> |
|--------------|-------------------------------|
| A | 4.00 |
| A- | 3.67 |
| B+ | 3.33 |
| B | 3.00 |
| B- | 2.67 |
| C+ | 2.33 |
| C | 2.00 |
| D | 1.00 |
| F | 0 |

Grade points are determined by multiplying the grade-point equivalent of the grade earned by the number of credits for the subject; e.g., ENGL 015 (GWS;DEX), 3 credits, with a grade of A (grade-point equivalent 4.00) yields 12 grade points.

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GRADUATION REQUIREMENTS—In order to graduate, a student must (1) complete the course requirements of the major and earn at least a C average (a grade-point average of 2.00) for all courses and (2) earn at least a C grade in each major course designated by the major as a C-required course.

DEGREES—The associate degree majors outlined in this bulletin lead to the following degrees: Associate in Arts, Associate in Engineering Technology, and Associate in Science.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT THE UNIVERSITY PARK CAMPUS—Credits received for associate degree program courses may be applicable to a particular baccalaureate degree program listed in the current Penn State *Baccalaureate Degree Programs Bulletin* at the discretion of the appropriate college and major department.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT PENN STATE ERIE, THE BEHREND COLLEGE—Graduates of associate degree majors may also qualify for admission to a variety of baccalaureate degree majors at Penn State-Behrend. Students interested in applying to Penn State-Behrend should contact that college's Admissions Office or talk with the Penn State-Behrend representative at their campus.

Graduates of associate degree majors in either Business Administration or Computer Science may want to continue study in one of the following baccalaureate degree majors at Penn State-Behrend: Accounting; Business Economics; Business, the Liberal Arts, and Science; Management; or Management Information Systems. Students graduating with a two-year degree in Letters, Arts, and Sciences may want to consider any of a large number of majors offered by Penn State-Behrend in the liberal arts, sciences, and business.

Graduates of associate degree majors in Biomedical Equipment Technology, Electrical Engineering Technology, Microcomputer Engineering Technology, and Telecommunications Technology may want to continue their education in the baccalaureate degree major in Electrical Engineering Technology. Students receiving an Associate in Engineering Technology degree in Mechanical Engineering Technology or Architectural Engineering Technology or Building Energy Systems Technology may want to continue study in a baccalaureate degree major in either Mechanical or Plastics Engineering Technology.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT PENN STATE HARRISBURG—In addition to receiving an education to prepare for employment, the graduate of an associate degree program may also qualify for admission to various programs leading to a baccalaureate degree from Penn State Harrisburg. Those anticipating admission to Penn State Harrisburg should inquire at that college's Admissions Office late in their freshman year or early in their sophomore year concerning baccalaureate degree course requirements.

Graduates from associate degree programs in Business Administration or Computer Science may want to consider further study at Penn State Harrisburg in a Business Administration baccalaureate degree program.

Graduates of the associate degree majors in Architectural Engineering Technology, Biomedical Equipment Technology, Building Energy Systems Technology, Electrical Engineering Technology, Materials Engineering Technology, Mechanical Engineering Technology, Nuclear Engineering Technology, Surveying Technology, and Telecommunications Technology may want to consider continuing at Penn State Harrisburg in an engineering technology major leading to a bachelor of science degree in engineering technology. Majors are offered in Electrical Engineering Technology, Computer Engineering Technology, Environmental Engineering Technology, Mechanical Engineering Technology, and Structural Design and Construction Engineering Technology.

Associate degrees in the following majors are also acceptable toward admission to baccalaureate degree majors at Penn State Harrisburg: Forest Technology; Hotel, Restaurant, and Institutional Management; Letters, Arts, and Sciences; Medical Laboratory Technology; Microcomputer Engineering Technology; and Sociology. Penn State Harrisburg programs related to these majors are offered by the college's Division of Humanities, Division of Behavioral Science and Education, and Division of Public Affairs.

Graduates of the associate degree majors in Science and in Computer Science may want to consider admission to the baccalaureate degree major in Mathematical Sciences at Penn State Harrisburg.

BACCALAUREATE DEGREE PROGRAMS—Graduates of associate degree majors also may qualify for admission to one of the baccalaureate degree programs offered at the following Penn State campuses: B.A. or B.S. in Administration of Justice at Fayette and Ogontz Campuses; B.S. in Electrical Engineering Technology at Berks, New Kensington, and Wilkes-Barre Campuses; B.A. in General Arts and Sciences at Altoona, Beaver, Delaware County, DuBois, Fayette, Hazleton, Mont Alto, McKeesport, Ogontz, Schuylkill, and Shenango Campuses; B.S. in Mechanical Engineering Technology at Berks and New Kensington Campuses, and B.S. in Nursing at a number of Penn State locations across the Commonwealth. For more information, contact the Admissions Office at the campus offering the program.

STUDENT WELFARE

STUDENT GOVERNMENT—Representative student leadership is provided on each campus of the University by a student government association that functions through officers and representatives elected from and by the student body. In addition to their involvement in student programs at their local campuses, student officers and delegates from University campuses convene several times annually. These meetings provide for an exchange of information among the various student government associations and for systemwide coordination in student government and student activities.

STUDENT CONDUCT—The Code of Conduct prohibits acts that interfere with the basic purposes or processes of the University, or with the rights, health, and safety of its members. Such acts include, but are not limited to, academic dishonesty, unethical and destructive behavior, and violation of rules and regulations. Violations of the code are subject to disciplinary action that may include separation from the University. Students, faculty, or staff may file complaints regarding student violations of the Code of Conduct with the Office of Conduct Standards at any University location.

INSURANCE PROTECTION WHILE ATTENDING THE UNIVERSITY—Any student who wants insurance protection while in attendance at the University (1) against personal injury or liability, and/or (2) against loss of property by fire or theft must arrange personally for whatever insurance is desired.

HEALTH SERVICES—University Health Services assists in promoting and maintaining the health of students.

Prior to their initial registration, all new full-time students entering the University must submit a health history on a special form provided by the University. The completed form constitutes a vital part of the student's medical record.

The health services of the University are made available to students in accordance with a statement provided by each campus, pertinent to that campus, and published in its student handbook.

The University does not obligate itself for payment of medical services other than those provided by personnel employed or retained by the University and in facilities owned or contracted for by the University. Treatment provided in contract facilities must be authorized by the campus executive officer, the director of student programs and services, or the nurse.

Students are urged to protect themselves against medical expenses that may result from injury or illness by arranging for personal insurance coverage. An accident and sickness plan is available to all undergraduate students at a reasonable charge through the University Health Services, Student Insurance Office, (814) 865-7467.

DISABLED STUDENT SERVICES—Penn State encourages academically qualified disabled students to take advantage of its educational programs. It is the policy of the University not to discriminate against persons with disabilities in its admission policies or procedures or its educational programs, services, and activities.

The University is responsible for making all of its programs and services available to all its students. In cases where it is necessary to provide auxiliary services and programs to meet the specific needs of disabled students, it is the responsibility of the coordinator of the Office for Disability Services to make reasonable accommodations. Examples of such accommodations available to those with special needs are sign language interpreters, accessible University transportation, and

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classroom and library assistance. Students anticipating the need for special services, both before and after enrollment, are encouraged to contact the coordinator of the Office for Disability Services at University Park Campus (105 Boucke Building) or the director of student programs and services at other campuses.

CAREER DEVELOPMENT AND PLACEMENT SERVICES—Career Development and Placement Services assists students in continual evaluation of their educational and career plans as they progress through college and helps them identify sources of personal or academic difficulty that may interfere with their progress. Individual as well as group educational and career counseling programs are available to students. Computerized guidance systems, DISCOVER or SIGI-PLUS, are available for student use at each campus location.

A Student Programs and Services staff member at each campus is responsible for providing placement assistance for associate degree graduates. Services include inviting employers to the campus to interview graduates for permanent employment, providing job information, and assisting students in preparing for the job search process. Career Development and Placement Services at the University Park Campus supplies prospective employers (national, state, and local) with information concerning the associate degree programs and works cooperatively with the Commonwealth Campuses in assisting graduates to locate suitable employment.

STUDENT AID

In addition to the student aid information provided below, students may want to consult the admissions booklets sent to all applicants and the *An Overview of Costs and Student Aid at Penn State* brochure, available upon request. Additional questions should be directed to the Office of Student Aid, 314 Shields Building, on the University Park Campus, or to the student aid representative at other Penn State campuses.

AID PROGRAMS AVAILABLE TO ASSOCIATE DEGREE CANDIDATES

GRANTS (aid sources not requiring repayment)

Federal Pell Grant—The Federal Pell Grant is the major grant program available to undergraduates. This award is available to undergraduates pursuing an associate degree.

Pennsylvania Higher Education Assistance Agency (PHEAA) Grant—This is a grant offered by the Commonwealth of Pennsylvania to assist undergraduates who have a financial need as defined by PHEAA guidelines. Applicants must be residents of Pennsylvania and enrolled full-time.

NOTE: Non-Pennsylvania residents should contact their home state higher education assistance agencies for information on state grants available for attending Penn State. Names and addresses of higher education assistance agencies are available from the Office of Student Aid at University Park Campus or the student aid representative at any other Penn State campuses.

Federal Supplemental Educational Opportunity Grant (SEOG)—This grant is available to undergraduates with high financial need. It normally is awarded in combination with the Federal Work-Study Program and/or the Federal Perkins Loan. Priority is given to students who appear eligible for the Federal Pell Grant.

Penn State Academic Grant—This grant is awarded to students demonstrating academic excellence and high financial need.

LOANS

Federal Stafford Loan—The Federal Stafford Loan is a subsidized loan program of the Department of Education, available through banks, savings and loan associations, credit unions and other private lenders. It offers students (attending on at least a half-time basis) the opportunity to borrow money

for their education. The current interest rate is 6.94 percent (set annually). Repayment begins six months after a student ceases enrollment. First year undergraduate students can borrow up to \$2,625; second-year, \$3,500; third-year, \$4,500; fourth- and fifth-year, \$5,500. The maximum borrowing limit is \$23,000 for undergraduate studies.

Federal Unsubsidized Stafford Loan—This is a loan program of the Department of Education, available through banks, savings and loan associations, credit unions and other private lenders. This loan is available to students who demonstrate limited or no eligibility for the Federal Stafford Loan and requires a payment of the accruing interest while the student is enrolled. Terms and conditions for this loan, including borrowing limits, are consistent with those of the Federal Stafford Loan program.

Federal PLUS/SLS Loan—Parent Loan for Undergraduate Students (PLUS) is an educational loan available to parents of dependent students (both undergraduate and graduate). Similar to Federal Stafford Loans, funds are borrowed from banks and private lenders. The current interest rate on this loan is 7.51 percent (set annually) and repayment of the loan begins sixty days after a promissory note is signed. Parents may borrow up to the student's cost of attendance (minus other aid). The program currently has no borrowing limits.

Supplemental Loans for Students (SLS) is an educational loan program available for independent students who require funds in excess of Federal Stafford Loan funds (subsidized and unsubsidized). Funds are borrowed from banks and private lenders. The current interest rate on this loan is 7.51 percent (set annually) and repayment of the loan begins sixty days after a promissory note is signed. First and second-year students can borrow up to \$4,000 per year. All other undergraduates can borrow up to \$5,000 per year. The maximum borrowing limit is \$23,000 for undergraduate studies.

Federal Perkins Loan—This program provides loans of up to \$1,000 per year for students who demonstrate financial need. The career maximum borrowing limit for undergraduate students is \$9,000. The interest rate on this loan is 5 percent and repayment begins nine months after a student ceases enrollment. Postponement of repayment or cancellation of the loan may be arranged under certain conditions following graduation.

University Loans—University Loans are funds established to help students with financial need. Funds are available, in limited amounts, to students nearing the end of their academic career and experiencing unique circumstances. Repayment of this 6 percent interest loan begins six months after the student ceases enrollment.

NOTE: First-time, freshman borrowers of Federal Stafford Loan (subsidized and unsubsidized) and SLS Loan funds must wait 30 days after the beginning of the semester before funds can be disbursed. Also, all first-time Penn State students (graduate and undergraduate) borrowing in the Federal Stafford Loan (subsidized and unsubsidized) and SLS Loan Program must participate in "Entrance Counseling" concerning loan obligations before any funds can be disbursed.

EMPLOYMENT

Federal Work-Study Program (FWSP)—The Federal Work-Study Program is a form of aid that allows students to earn a portion of their documented financial need through an approved FWSP position. This is a non-repayable source of aid since the student is paid an hourly wage for his or her employment.

Student Employment—Students who are interested in part-time employment on campus or in their local area should contact their campus Employment Office.

SCHOLARSHIPS

University Scholarships—University scholarships are awarded on the basis of superior high school or college academic performance and, in most cases, documented financial need. They are awarded either by the scholarship committees in the various Penn State academic colleges, by the Freshman or Faculty Senate Scholarship Committee, or by Commonwealth Campus scholarship committees.

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HOW TO APPLY

ALL students (graduate and undergraduate) must complete a *Free Application for Federal Student Aid*. Pennsylvania residents must also complete the *Pennsylvania Higher Education Assistance Agency (PHEAA) Aid Information Request Form*. Non-Pennsylvania residents should check with their home state grant agencies to determine if additional forms must be completed. Applications are available from high school guidance counselors, the Office of Student Aid, 314 Shields Building, University Park, PA, 16802-1220; or the student aid representative at other Penn State Campuses. The recommended filing date for all applications is as soon after January 1 as possible but not later than February 15 of each year. The applications allow students to be considered for: State Grants, Federal Pell Grant, Federal SEOG, Federal Perkins Loan, Federal Work-Study, Penn State Academic Grant, Federal Stafford Loan (subsidized and unsubsidized), Federal PLUS/SLS Loans, University Loans, and University Scholarships.

Freshman students are automatically considered for all available University scholarships (academic colleges may require a separate application). Returning and transfer students must file a separate University Scholarship Application, available at the Office of Student Aid at University Park Campus or through the student aid representative at other Penn State campus. Separate applications, available from lenders, are also required for consideration for Federal Stafford Loan and Federal PLUS/SLS Loan funds.

HOW MUCH DOES IT COST TO ATTEND PENN STATE?

One of the major concerns of students and their parents is knowing how much it will cost to attend Penn State for an academic year. The following itemized list of expenses, although prepared for the 1992-93 academic year, may be used as a basic guide for planning. Students may find that some of the costs vary according to individual needs and circumstances.

STUDENT BUDGET—1992-93

| | <i>Residence Halls or Off-Campus Housing</i> | <i>Living at Home</i> |
|---|--|-------------------------------|
| Tuition and Fees | \$4,618* | \$4,618* |
| Room & Board | 3,790 | 1,500 |
| Books & Supplies | 464 | 464 |
| Clothing & Laundry, Transportation, Personal Maintenance, Medical, & Recreation | 2,312 | 2,764 |
| Total* | \$11,184 | \$9,146 |

*For non-Pennsylvania residents, the nonresident undergraduate tuition and fees figure of \$9,644 should be substituted. The total estimated budget for a non-Pennsylvania undergraduate student at any campus location is \$16,210.

For Pennsylvania residents, 1992-93 undergraduate tuition and fees at the Commonwealth Campuses is \$4,404.

STUDENT AID POLICIES

The Office of Student Aid at Penn State administers and coordinates the aid programs according to applicable federal and state regulations and University policies that guarantee each student equal access to financial assistance. The Office of Student Aid employs the standard need analysis services of the Pennsylvania Higher Education Assistance Agency, a licensed agent of the Department of Education, to assess the aid eligibility of student applicants, ensuring equity of treatment among all applicants.

Eligibility for aid is contingent upon the student's financial need for assistance to meet educational costs. Each program has specific eligibility requirements that must be met before funds are awarded. In addition to financial need as a criterion for receiving aid, a student must be enrolled as a degree or provisional student. Nondegree students are not eligible to receive aid at Penn State. The University may require an official copy of the Federal Income Tax Form 1040 to verify eligibility for aid.

The Office of Student Aid assumes that all aid applicants will keep apprised of all application deadlines pertaining to the aid sources they are seeking. Because limited funds are available, applications filed after the applicable deadline dates are considered only as funds permit. On-time applicants receive first consideration. Some aid programs have flexible application deadlines that permit students to receive consideration at most times during the year (for example, the Federal Pell Grant and Federal Stafford Loan programs). Current and prospective aid recipients are strongly encouraged to keep well informed of aid application procedures through aid publications, news media, and agencies providing aid information such as the Office of Student Aid at University Park Campus and the student aid representative at other Penn State campuses.

Aid is never automatically awarded for subsequent years. Students must reapply each year for funds. Students who plan to attend during summer session must file former-year as well as current-year applications to be considered for all aid programs. The Federal Pell Grant program has no separate summer application and is generally awarded to students during the fall/spring academic year. Federal Pell Grant recipients not attending the entire fall/spring year should contact the Office of Student Aid to determine if a summer payment is possible.

One of the goals of the Office of Student Aid is to help student aid recipients receive a student aid package that will attempt to meet the student's documented financial need. The student aid package can be composed of federal aid, state grant monies, private award sources, or any other source of funds available to the student.

It is the responsibility of the Office of Student Aid, however, to assure the federal government that federal aid recipients will not be permitted to retain financial aid *exceeding* their financial need. Students should be aware that if the aid received is in excess of financial need, they will be notified of their responsibility to return the excess amount to the University.

FEDERAL STUDENT ASSISTANCE SATISFACTORY ACADEMIC PROGRESS STANDARD

Satisfactory academic progress must be maintained for continued consideration for federal financial assistance at Penn State. Students must comply with the following to ensure continued consideration:

1. Academic progress is determined during an annual review each spring. The review determines student aid eligibility for the next enrollment period (summer session and/or the following academic year).
2. Undergraduate students registering full-time must complete a minimum of 24 credits (based on full-time enrollment) in their first year to maintain satisfactory academic progress. Upperclass students can maintain satisfactory academic progress by continuing to successfully complete the minimum credits required.
3. The minimum credit requirement is determined in proportion to the number of credits registered. For example, three-quarter-time students will be required to progress at 3/4 the minimum standard.
4. Students who drop credits, withdraw from a semester, unsuccessfully complete credits, enroll in audit or repeat courses, etc., may fall below the minimum requirement for satisfactory progress.
5. A probation period is granted to undergraduate students who fall below the minimum credit requirement, but within the probation standard. Students on probation remain eligible for aid. The probation period lasts one academic year, after which the minimum credit requirement must be satisfied for future student aid eligibility.
6. Undergraduate students who are more than 10 credits deficient of the minimum credit requirement are determined to be making unsatisfactory progress and are not eligible for student aid.
7. Students falling to unsatisfactory progress, but returning to satisfactory progress through completion of summer session or fall semester credits, may be considered for student aid during the remainder of the academic year, on a funds-available basis.
8. Requirements for the associate degree must be completed within six semesters.

Exceptions to the above and information concerning reinstatement of aid can be obtained by contacting the Office of Student Aid, The Pennsylvania State University, 314 Shields Building,

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University Park, PA 16802-1220. Copies of the Federal Student Assistance Satisfactory Academic Progress Standard are available from the Office of Student Aid at University Park Campus or the Office of Student Programs and Services at other Penn State campuses.

SELECTIVE SERVICE REGISTRATION COMPLIANCE

Educational institutions are now required by law to collect a Statement of Registration Compliance from every federal student aid recipient whether male or female. This attests to their status with the Selective Service. Disbursement of federal student aid funds cannot occur until the Statement of Registration Compliance is on file with the Office of Student Aid. This requirement applies to Federal Perkins Loan (NDSL); Federal SEOG; FWSP, Federal Pell, Federal Stafford Loan, and Federal PLUS/SLS programs.

DEFAULT STATEMENT

Educational institutions also are required by law to collect a Default Statement from every federal student aid recipient. This certifies that the student is not in default on any loan made under the Federal Stafford Loan, Federal PLUS/SLS, Consolidation, Income Contingent, or Federal Perkins Loan (NDSL) programs and that he/she does not owe a refund on a grant received under the Federal Pell Grant, Federal SEOG, SSIG, or Byrd Scholarship programs. Disbursement of federal aid funds cannot occur until the Default Statement is on file with the Office of Student Aid. This requirement applies to the Federal Perkins Loan (NDSL), Federal SEOG, FWSP, Federal Pell, Federal Stafford Loan, and Federal PLUS/SLS programs.

ESTIMATED TUITION, ROOM, BOARD, AND OTHER CHARGES

Note: The University reserves the right to revise tuition, room, board, and other charges without further notice. Tuition and charges for baccalaureate and graduate programs are listed separately in the *Baccalaureate Degree Programs*, *Graduate Degree Programs*, and *Penn State Harrisburg Bulletins*. Penn State has two semesters and a summer session. Students normally attend two semesters per year. The tuition and charges set forth below are for the 1992-93 academic year. The actual tuition and charges for the 1993-94 academic year will be established prior to the beginning of the fall semester of the academic year.

TUITION—Tuition per semester for associate degree students in 1992-93:

| | <i>Pennsylvanians</i> | <i>Non-Pennsylvanians</i> |
|---|-----------------------|---------------------------|
| 12 or more credits: | | |
| University Park Campus, Penn State-Behrend, | | |
| Penn State Harrisburg | \$2,274 | \$4,787 |
| Commonwealth Campuses | 2,202 | 4,787 |
| 11 or fewer credits: | | |
| University Park Campus, Penn State-Behrend, | | |
| Penn State Harrisburg—rate per credit | \$190 | \$424 |
| Commonwealth Campuses—rate per credit | 177 | 424 |

Enrollment Charge—All entering students who plan to enroll for 12 or more credits are required to pay a nonrefundable enrollment charge of \$75 upon acceptance of an offer of admission.

General Deposit—Undergraduate students are required to make a general deposit of \$50 at the time of admission. This deposit will serve to safeguard the property and equipment used by students in their course of study. It will be retained until a student withdraws or is graduated.

The deposit, less any charges for equipment damages, losses, and forfeitures, will be refunded early in the subsequent semester to the student who has withdrawn or been graduated. The refund will be made by check and mailed to the student's home address.

Credit by Examination—A charge of \$30 per credit is made for credit by examination. For evaluation of credits completed elsewhere, a charge of \$35 is made for those applying for admission and a charge of \$3 for those who are already matriculated.

TUITION, ROOM, BOARD, AND OTHER CHARGES

Student Activities—Student activities charges are determined by elected representatives of the student body, together with a faculty representative.

Certification and Verification Fee—A charge of \$4 is made for each request for verification or certification of enrollment.

Change of Schedule Charge—Unless a change is necessitated by the University, a charge of \$6 per day is made for each change of schedule after the first five working days of a semester.

Late Registration Charge—Unless the delay is unavoidable, \$10 is charged a student who fails to register on the appointed day.

Other Expenses—Books and supplies must be secured by the student. These vary, starting at approximately \$200 per semester, depending upon the program.

TERMS OF PAYMENT—Tuition and charges, including room and board, are due and payable in advance of each semester at the Office of the Bursar, The Pennsylvania State University, 103 Shields Building, University Park, PA 16802-1282. Registration for courses is not complete until a semester bill is processed.

Approximately six weeks in advance of each semester, the University will mail to each continuing and newly admitted degree student of record a semester bill for tuition and, where applicable, residence hall charges. Payment by mail is encouraged before the established deadline. The receipt is returned to the student by mail. If checks tendered for payment of tuition and charges are not paid upon presentation to the maker's bank, the student will automatically incur the late payment fee of \$25, and the receipt previously mailed will be considered null and void.

Any student who does not fulfill payment of obligations by the deadline established may be charged the late payment fee of \$25. This charge for late payment also applies to unpaid student supplemental charges. Students whose accounts are delinquent for more than ten days are subject to suspension from the University.

The University reserves the right to withhold transcripts and services to any current or former student who has an unsatisfied financial obligation to the University.

COMPUTER FEE—The fee is a nonrefundable general University fee chargeable to *all* students, regardless of whether they are on campus or off campus (e.g., student teaching, Co-op assignment, etc.). The only exceptions are summer session students and students registering in 601 through 611 courses.

A student's scheduled courses as of the first day of the semester determine the fee according to the following schedule:

| | |
|-----------------------------|------|
| 4 credits or less | \$12 |
| 5–8 credits | \$25 |
| 9 or more credits | \$35 |

If credits are added, the fee could increase; however, the fee *will not* be reduced if credits are dropped.

SURCHARGE—The fee is nonrefundable and is in addition to tuition charges for all College of Earth and Mineral Sciences, College of Engineering, and Department of Architecture and Landscape Architecture students in the fifth semester or higher, regardless of whether they are on campus or off campus (e.g., Co-op assignment, Education Abroad, multiple campus registration, etc.). The only exceptions are summer session students and students registering in 601 through 611 courses.

A student's scheduled courses as of the first day of the semester determine the fee according to the following schedule:

| | |
|-----------------------------|-------|
| 4 credits or less | \$60 |
| 5–8 credits | \$120 |
| 9 or more credits | \$200 |

If credits are added, the fee could increase; however the fee *will not* be reduced if credits are dropped.

TUITION ADJUSTMENT POLICY

WITHDRAWAL—Charges for tuition, room, and board are adjusted upon withdrawal from the University only in the event the student obtains an Official Withdrawal Form at the office of the dean of his or her college or other degree-granting unit and presents it at the Office of the Registrar. Adjustments of tuition are based upon the date of last class attended provided the Official Withdrawal Form is presented within one calendar month of that date, otherwise the adjustment will be based on the date the Official Withdrawal Form is presented at the appropriate office. Adjustments of room and board are based upon the date belongings are removed and the room key and meal ticket are returned, or the effective date of the withdrawal from classes, whichever is later. Students, both full-time and part-time, who meet these conditions are entitled to receive adjustments of tuition, room, and board in accordance with the following schedule:

Adjustment of 80 percent upon withdrawal before the end of the first week of the semester (seventh consecutive calendar day from the first day of classes) and a decrease of 10 percent for each week thereafter up to and including the eighth consecutive calendar week. No adjustment for withdrawal will be made after the eighth consecutive calendar week of the semester.

ADJUSTMENT OF CHARGES FOR TUITION, COURSES LESS THAN FIFTEEN WEEKS (SEMESTER)

| <i>Duration of Course</i> | <i>Tuition-Adjustment Percentage</i> |
|---------------------------|---|
| 1 week or less | 0 |
| 2–3 weeks | first week 50; second week 0 |
| 4–5 weeks | first week 70; second week 40; third week 0 |
| 6 weeks | first week 70; second week 40; third week 20; fourth week 0 |
| 7–10 weeks | first week 80; second week 60; third week 40; fourth week 20; fifth week 0 |
| 11 weeks or more | 80 percent first week and a decrease of 10 percent for each week thereafter up to and including the eighth consecutive calendar week. |

POLICY FOR STUDENTS ENROLLED FOR 12 OR FEWER CREDITS—If a student is enrolled for 12 or fewer credits and drops 1 or more credits, adjustments will be determined on the effective date of the drop using the same adjustment percentage as listed above under withdrawal.

TERMS OF ADJUSTMENT—The University will not release refunds of tuition, room, and board until at least three weeks have elapsed from the date the payment was received. All refunds will be made by check and mailed to the student's home address. No refunds will be made for other charges.

Requests for refunds based on withdrawal from the University should be addressed to the Office of the Bursar, The Pennsylvania State University, 103 Shields Building, University Park, PA 16802-1282.

Deposits or deposit balances and credit balances on student accounts will be refunded to the student early in the semester following the student's withdrawal or graduation. The refund will be made by check and mailed to the student's home address that is currently on file with the University. All financial obligations of every kind, whether matured or unmatured, due and owing to the University must be completely settled before any refund is issued.

If, due to incorrect student address information, the University's attempt to forward a refund fails, the University will retain the deposit and/or the student account credit balance for one year. After one year, the refund amount will become a general gift to the University.

DELINQUENT ACCOUNTS—Any charge incurred in collecting a delinquent account will be added to the account. This applies, but is not limited to, charges by an attorney or collection agency.

RESIDENCY CLASSIFICATION FOR TUITION PURPOSES

PENNSYLVANIA CLASSIFICATION

A student shall be classified as a Pennsylvania resident for tuition purposes if that student has a Pennsylvania domicile. A domicile is a person's existing and intended fixed, permanent and principal place of residence. A student whose presence in the Commonwealth is primarily for *educational purposes* shall be presumed to be a non-Pennsylvania resident for tuition purposes. The following are considerations that may be used by the University in determining whether a student is a resident for tuition purposes:

1. A student under the age of 21 is presumed to have the domicile of her/his parent(s) or legal guardians(s), unless the student has maintained continuous residence in the Commonwealth for other than educational purposes for a period of at least 12 months immediately prior to her/his initial enrollment at The Pennsylvania State University, and, the student continues to maintain such separate residence.
2. A student who has resided in the Commonwealth *for other than educational purposes* for at least a period of twelve (12) months immediately preceding his/her initial enrollment at The Pennsylvania State University is presumed to have a Pennsylvania domicile.
3. A student who has not resided continually in Pennsylvania for a period of twelve (12) months immediately preceding her/his initial enrollment at The Pennsylvania State University is presumed to have a non-Pennsylvania domicile.
4. A student requesting to be classified as a Pennsylvania resident for tuition purposes must be a citizen of the United States or must have indicated by formal action her/his intention to become a citizen or must have been admitted to the United States on an immigrant visa. A student admitted to the United States on a tourist or a student (nonimmigrant) visa is not eligible for a classification as a Pennsylvania resident for tuition purposes unless the student has indicated by formal action her/his intention to become a United States citizen.
5. A United States government employee or member of the armed forces who was a resident of Pennsylvania immediately preceding his/her entry into government service and who has continuously maintained Pennsylvania as her/his domicile will be presumed to have a Pennsylvania domicile. Military personnel and their dependents who are assigned to an active duty station in Pennsylvania and who reside in Pennsylvania shall be charged in-state tuition rates.
6. A student receiving a scholarship, guaranteed loan, grant, or other form of financial assistance dependent upon residence in a state other than Pennsylvania is not a Pennsylvania resident for tuition purposes.

RECLASSIFICATION AS A PENNSYLVANIA RESIDENT

A student requesting reclassification as a Pennsylvania resident for tuition purposes must demonstrate by clear and convincing evidence that his/her domicile is in Pennsylvania, and that his/her presence in Pennsylvania is not primarily for educational purposes. Each request shall be decided individually on the basis of all evidence submitted by the petitioner. Accordingly, it is not possible to list a specific combination of factors or set of circumstances which, if met, would ensure reclassification for tuition purposes.

RECLASSIFICATION PROCEDURE

1. A student may challenge her/his residence classification by filing a written petition with the person or committee designated to consider such challenges at the University. Such person or committee shall consider such petition and render a timely decision that shall constitute an exhaustion of administrative remedies.
2. Any reclassification resulting from a student's challenge or appeal shall be effective at the beginning of the semester or session during which the challenge or appeal was filed or at the beginning of the following semester or session. The decision as to which semester or session becomes the effective date shall rest with the person or committee rendering the decision on reclassification.

GENERAL INFORMATION

3. A student who changes her/his place of residence from Pennsylvania to another state is required to give prompt written notice of this change to the University and shall be considered for classification as a non-Pennsylvanian for tuition purposes effective with the date of such change.
4. A dependent resident student whose parent(s) or legal guardian(s) move outside of the Commonwealth may remain a Pennsylvania resident for tuition purposes if she/he continues to maintain a separate domicile within the Commonwealth.

NONRESIDENT STUDENT CLASSIFICATION

A student is initially classified as a nonresident based on information provided by the student when applying for admission to the University. The initial classification is made as follows:

1. Undergraduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Academic Services Officer
 - b. All other locations—Undergraduate Admissions Office, The Pennsylvania State University, University Park, PA 16802
2. Graduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Academic Services Officer
 - b. All other locations—Dean of the Graduate School
3. Medical Student
Office of Student Affairs, The Milton S. Hershey Medical Center

A student may challenge his/her residency classification by filing a written petition as follows:

1. Undergraduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Financial Officer
 - b. All other locations—Fee Assessor, University Park Campus
2. Graduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Financial Officer
 - b. All other locations—Fee Assessor, University Park Campus
3. Medical Student
Controller, The Milton S. Hershey Medical Center

ACADEMIC PROGRAMS

GENERAL EDUCATION

The University Faculty Senate, at its meeting on April 30, 1985, adopted the following statement as a comprehensive definition of general education:

General Education is the breadth of knowledge involving the major intellectual and aesthetic achievements of humanity. This must include understanding and appreciation of the pluralistic nature of knowledge epitomized by the natural sciences, mathematics, social-behavioral sciences, humanities, and the arts. General Education aids students in developing intellectual curiosity, strengthened ability to think, and a deeper sense of aesthetic appreciation. General Education, in essence, aims to cultivate a knowledgeable, informed, literate human being.

An effective General Education program enables students to:

1. acquire knowledge through critical reading and listening;
2. analyze and evaluate, where appropriate in a quantitative manner, the acquired knowledge;
3. integrate knowledge from a variety of sources and fields;
4. make critical judgments in a logical and rational manner;
5. recognize and comprehend the role of physical activity in meeting the demands of daily living;
6. learn to communicate effectively;
7. comprehend the reality of international interdependence and cultural diversity;
8. comprehend the role of aesthetic and creative activities in meeting the demands of daily living.

Courses taken to meet General Education program requirements may not be taken under the Satisfactory-Unsatisfactory option.

The General Education program for Penn State associate degree students consists of 21 credits distributed among communication and quantification skills (6 credits); the distribution areas (12 credits), including breadth and depth courses in the natural sciences (3 credits), arts (3 credits), humanities (3 credits), and social and behavioral sciences (3 credits); and an additional 3 credits in any General Education area.

Opportunities for qualified students to substitute advanced courses for courses on the breadth and depth lists are indicated below.

A. Breadth Courses

Breadth courses introduce and integrate major areas of knowledge, presenting the most fundamental and universal concepts, issues, and achievements in the discipline or cluster of disciplines. They represent the offering unit's special effort to help a wide range of students obtain coherent overviews of major findings and modes of investigation. While each breadth course stimulates further interest in the discipline(s), it may be, for many students, the only course taken in the discipline(s). Each breadth course, therefore, develops for such students a substantial, nonspecialized appreciation for the primary ways in which the discipline or cluster of disciplines contributes to a useful understanding of the human condition and/or its environment.

1. *Natural sciences breadth courses* emphasize the order, diversity, and beauty of nature, the concepts in the disciplines most useful to an informed citizenry, and how scientific understanding can bear on the formulation of individual and social values. The courses promote understanding of the inductive and deductive reasoning processes and develop a student's ability to reason inductively and deductively.

Scientific and technical disciplines require more advanced courses in basic sciences as essential foundations for further study in a range of majors. Such courses, which assume an already developed sense of the "general" aspects of the field, may be substituted for natural sciences breadth courses in any major.

ACADEMIC PROGRAMS

2. *Arts breadth courses* emphasize how the traditions, literature, and history of the arts and architecture express the cultural values of society. These courses introduce major figures, ideas, and artistic achievements in coherent patterns across substantial chronological ranges. They examine the terminology, techniques, attitudes, ideas, and skills that the arts areas comprise, so students can understand the approaches to human existence that distinguish the arts.
3. *Humanities breadth courses* emphasize coherent overviews of cultural and intellectual currents shaping or interpreting individual and social values. In thematically coherent patterns, they relate major figures, ideas, achievements, and/or world-shaping events to the most enduring continuities in human experience. Breadth courses in history, literature, philosophy, religion, and interdisciplinary humanities explore these topics across substantial chronological ranges, consistently relating the past to the present.
4. *Social and behavioral science breadth courses* emphasize major concepts, findings, and analytic methods most useful to an informed citizenry that needs to understand politics, economic systems, social institutions, individual and group behavior, and human communication. Such courses emphasize how an understanding of the multiple nature of causality in social settings can bear on the formulation of individual and social values.

B. Depth Courses

Depth courses, while emphasizing the same concepts as the breadth courses, are narrower in scope. Depth courses provide opportunities to pursue selected major concepts, issues, and achievements in more detail than is possible in breadth courses. Depth courses also emphasize how a particular focus, whether on the past or present, is relevant to current individual, social, and/or scientific issues. The varying degrees of specialization in depth courses extend or deepen the perspectives, knowledge, and analytic skills emphasized in breadth courses.

Listed depth courses are generally numbered below the 200 level. A student who has developed general interests and competencies in any of the four distribution areas may, in consultation with an adviser and with the approval of the student's college dean, substitute 200- to 499-level courses for those on the list of depth courses.

COURSES TO BE USED FOR GENERAL EDUCATION

A. Skills (6 credits)

1. WRITING/SPEAKING (3 credits)

Courses designated with the suffix GWS satisfy this component.

2. QUANTIFICATION (3 credits)

Courses designated with the suffix GQ satisfy this component.

B. Distribution Component (12 credits)

Both breadth and depth courses satisfy this component. Students must take at least 3 credits of breadth or depth courses in each of the four areas of the distribution component.

1. *Breadth courses* are identified by the suffix G followed by a letter code corresponding to each of the distribution areas.

- a. Natural sciences breadth courses (GN)
- b. Arts breadth courses (GA)
- c. Humanities breadth courses (GH)
- d. Social and behavioral sciences breadth courses (GS)

2. *Depth courses* are identified by the suffix D followed by a letter code corresponding to each of the distribution areas, e.g., depth courses in the natural sciences carry the suffix DN. A stu-

dent may, in consultation with the adviser and the approval of the student's college dean, substitute 200- to 499-level courses for those on the list of depth courses.

- a. Natural sciences depth courses (DN)
- b. Arts depth courses (DA)
- c. Humanities depth courses (DH)
- d. Social and behavioral sciences depth courses (DS)

C. An additional 3 credits in any General Education area

Students whose academic majors are in the areas of natural sciences, arts, humanities, and social and behavioral sciences may not meet the General Education program components by taking courses in the department or program *identical* to that of the academic major. All General Education courses are to help students explore and integrate information beyond the specific focuses of their major.

WRITING ACROSS THE CURRICULUM

Beginning in summer 1992, entering associate degree students are required to complete at least 3 credits of writing-intensive courses prior to graduation.

CULTURAL DIVERSITY

Beginning in summer 1992, entering associate degree students are required to take either 3 credits of Diversity Focused (DF/DFV) courses or 6 credits of Diversity Enhanced (DE/DEX) courses.

MAJORS

AGRICULTURAL BUSINESS (2 AGB)

PROFESSOR NEIL B. GINGRICH, *in charge*

The Agricultural Business major helps prepare students for employment in commercial agriculture and businesses serving agriculture. Three options allow students to specialize in either crop or livestock production or in agricultural business, which provides training in management, business organization, and sales.

The first two semesters are offered at selected Commonwealth Campuses, where students fulfill basic course requirements in accounting, business, English, and natural and social sciences. The second year at the University Park Campus provides course work in livestock and crop production, management, and agricultural business. As part of the requirements, there are supporting courses in agricultural engineering, farm management, agricultural marketing, and sales. Each option allows the student a choice of electives to satisfy special interests and needs.

For the Associate in Science degree in Agricultural Business, a minimum of 68 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(9-12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

ELECTIVES: 0-6 credits

X

X

REQUIREMENTS FOR THE MAJOR: 53–59 credits

(This includes 9–12 credits of General Education courses; 6 credits of GWS courses; 3 credits of DN courses; 0–3 credits of DS courses)

REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 26 credits

PRESCRIBED COURSES (23 credits)

ACCTG 200(3), B LAW 243(3), BIOL 101 DN(4), 102 DN(4),
CHEM 011(3), ENGL 015 GWS;DEX(3),
SPCOM 100 GWS(3)

X

—

ADDITIONAL COURSES (3)

ENGL 202A GWS OR 202D GWS(3)

X

—

REQUIREMENTS FOR THE OPTION: 27–33 credits

ANIMAL PRODUCTION OPTION: 33 credits

PRESCRIBED COURSES (18 credits)

AG E 214(3), AGRO 028(3), 200(3), AN SC 100(3),
202(3), PTYSC 201(1), 202(2)

—

X

ADDITIONAL COURSES (6 credits)

AG EC 101 DS, 106, or 208(3)

—

X

AN SC 007 or 201(3)

—

X

SUPPORTING COURSES AND RELATED AREAS (9 credits)

Select 6 credits in agricultural economics

—

X

Select 3 credits in agricultural engineering

—

X

CROP PRODUCTION OPTION: 27 credits

PRESCRIBED COURSES (18 credits)

AG E 214(3), 322(3), AGRO 028(3), 200(3),
AG EC 102(3), ENT 012(3)

—

X

ADDITIONAL COURSE (3 credits)

AG EC 101 DS, 106, or 208(3)

—

X

SUPPORTING COURSES AND RELATED AREAS (6 credits)

Select 3 credits in animal science or poultry science

—

X

Select 3 credits in horticulture

—

X

GENERAL OPTION: 33 credits

PRESCRIBED COURSES (6 credits)

AG EC 297(3), AGRO 200(3)

—

X

ADDITIONAL COURSES (15 credits)

AG EC 101 DS or 208(3); AG EC 102 or 232(3)

—

X

AG EC 106 or 200(3); AGRO 028 or PLTSC 200(3)

—

X

MGMT 100 or MKTG 220(3)

—

X

SUPPORTING COURSES AND RELATED AREAS (12 credits)

Select 3 credits in agriculture or business

—

X

Select 3 credits in agricultural engineering

—

X

Select 6 credits in animal or poultry science

—

X

PROFESSOR JOSEPH BŮRINSKÝ, *Program Coordinator, Worthington Scranton Campus*

*Scheduling Recommendation
by Semester Standing*

BIOMEDICAL EQUIPMENT TECHNOLOGY (2 BET)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology*

and Commonwealth Engineering, University Park Campus

PROFESSOR SCOTT SEGALWITZ, *Program Coordinator, New Kensington Campus*

During the past several decades, the medical community has grown to depend increasingly on machines for the delivery of quality health care. Biomedical equipment technicians are men and women responsible for maintaining these machines in accurate and safe working order. Their tasks include functional and safety inspecting, preventive maintenance, calibration, troubleshooting, and repair of this equipment. In addition, they may be involved in equipment control programs, in electrical safety assurance programs, and in training hospital personnel in the safe and proper use of the equipment. The classroom and laboratory portions of this major focus on electronically based patient monitoring equipment. The student is, however, exposed to a much broader spectrum of biomedical equipment through a ten-week practical internship in an approved health care facility. Graduates of the Biomedical Equipment Technology major may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Harrisburg and at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Biomedical Equipment Technology, a minimum of 75 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

*Scheduling Recommendation
by Semester Standing*

| | | |
|-----|-----|--------|
| 1-2 | 3-4 | Summer |
|-----|-----|--------|

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 66 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (63 credits)

| | | | |
|---|---|---|---|
| CMPSC 101 GQ(3), ENGL 015 GWS;DEX(3), MATH 087 GQ(5), 088 GQ(5) | X | — | — |
| EE T 101(3), 109 (1), 114(3), § 117(3), § 118(1), § 120(1), EG T 101(1), 102(1), ENGR 002(1) | X | — | — |
| BIOL 041 DN(3), CHEM 011(3), PHYS 150 GN(3), SPCOM 100 GWS(3) | — | X | — |
| BE T 201(5), 202(5), 204(3), 205(3) | — | X | — |
| BE T 203 (4) | — | — | X |

ADDITIONAL COURSE (3 credits)

Select 3 credits from the following technical courses:

| | | | |
|--|---|---|---|
| BE T 297, BIOL 029, CE T 261, CMPSC 102, EE T 211, 213, 297, EG T 203, I E 315, MCH T 211, or ME T 207 | — | X | — |
|--|---|---|---|

BUILDING ENERGY SYSTEMS TECHNOLOGY (2BEST)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology*

and Commonwealth Engineering, University Park Campus

PROFESSOR DAVID MEREDITH, *Program Coordinator, Fayette Campus*

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

This major helps prepare engineering technicians to work in all phases of the heating, ventilating, and air conditioning (HVAC) industry: from design to installation, from technical sales to testing, from customer service to system troubleshooting. Graduates are employed by public utilities, by building contractors, by systems manufacturers, and by design firms. A few have started their own businesses. Some graduates prepare the detail design drawings for new buildings, sizing components and locating them in their structures. Others select and specify the equipment needed for safe and efficient operation of HVAC systems. Still others test existing systems and recommend improvements in energy management. Technical sales positions in these industries are also available. The program's emphasis on energy systems enables graduates to understand both conventional and state-of-the-art technology, including active and passive solar systems. The program helps prepare graduates for current and future positions in the industry.

For the Associate in Engineering Technology degree in Building Energy Systems Technology, a minimum of 71 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at the Fayette Campus.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 62-63 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (57 credits)

| | | |
|--|---|---|
| AE T 101(3), 102(3), BES T 101(2),§ CMPSC 101 GQ(3), EG T 101(1),§ 102(1),§ ENGL 015 GWS;DEX(3), MATH 087 GQ(5), 088 GQ(5), ME T 281(4), PHYS 150 DN(3) | X | — |
| AE T 103(3), 204(3), BES T 204(3), 207(3), 208(3),§ 209(3), PHYS 151(3), SPCOM 100 GWS(3) | — | X |

ADDITIONAL COURSES (5-6 credits)

| | | |
|---|---|---|
| Select 5-6 credits from the following technical courses: AE T 207, 209, 210, 214, 215, 297, BES T 206, 297, CMPSC 102, CHEM 011, 012 DN, EG T 201, 297, MCH T 111, 212, 213, MATH 140 GQ, 141 GQ, 231, 250 | — | X |
|---|---|---|

BUSINESS ADMINISTRATION (2 B A)

PROFESSOR BENJAMIN HENSZEY, *in charge*

The two-year, college-level academic Business Administration major is designed to provide instruction in business administration that fulfills the requirements of various levels of responsibility higher than that held by high school graduates.

The primary objective of this major is to provide a managerially oriented program with sufficient communicative and mathematical skills, socially relevant course work, and advanced courses in specific business specialties to develop a well-rounded graduate.

Graduates of the Business Administration major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Business Administration, Humanities, or Public Policy offered at Penn State Harrisburg. Or they may qualify for admission to the baccalaureate degree majors in Accounting, Business Economics, General Business, Management, or Management Information Systems offered at Penn State Erie, The Behrend College.

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

COMPUTER ENGINEERING TECHNOLOGY

For the Associate in Science degree in Business Administration, a minimum of 68 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(6 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 53 credits

(This includes 6 credits of GWS General Education courses.)

PRESCRIBED COURSES (33 credits)

| | | |
|---|---|---|
| Q B A 200 | X | — |
| ACCTG 200(3), 204(3), B LAW 243(3), ENGL 015 GWS;DEX(3), FIN 100(3), § M I S 100(3), MGMT 100(3), § MKTG 221(3), § SPCOM 100 GWS(3) | X | X |
| ENGL 202D GWS(3) | — | X |

ADDITIONAL COURSES (18 credits)

| | | |
|---|---|---|
| ECON 002 GS, 004 GS, or 014 GS(3) [#] | — | X |
| Select 15 credits from ACCTG 150, 160, 170, 206, B A 100, 195, B LOG 301, 304, 305, CMPSC 101 GQ, 102, 140, ECON 002 GS,* 004 GS,* FIN 108, H P A 101, 301, 310, INS 102, L I R 100 DS, M I S 101, 103, 106, 110, 111, MGMT 150, MKTG 150, 160, 170, 180, 190, 220, OPMGT 150, PHIL 106, Q B A 201, R EST 100 | — | X |

SUPPORTING COURSES AND RELATED AREAS (2 credits)

| | | |
|--|---|---|
| Select 2 credits in physical education | X | X |
|--|---|---|

COMPUTER ENGINEERING TECHNOLOGY (2CPET)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology
and Commonwealth Engineering, University Park Campus*

PROFESSOR THOMAS G. SMITH, *Program Coordinator, Schuylkill Campus*

This major is designed to prepare graduates for technical positions in the rapidly expanding field of computers and their applications. A broad background in electrical and electronic principles is used as a foundation upon which to build the basic concepts of the microprocessor, to examine its internal functions, and to investigate its applications. Exposure to a variety of microprocessor computer systems and devices used with computers as well as hands-on experience in the operation, analysis, and construction of small computer systems provides graduates with a sound foundation for installing, diagnosing, and servicing of computer systems and the devices used with them.

Graduates of the Computer Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology or in Computer Engineering Technology offered at Penn State Harrisburg. Or they may qualify for the baccalaureate Electrical Engineering Technology major offered at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Computer Engineering Technology, a minimum of 73 credits is required.

[#]Students going on to a four-year program should not take ECON 014 GS.

*Select one not taken above.

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)**REQUIREMENTS FOR THE MAJOR: 64-66 credits**

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (60 credits)

| | | |
|---|---|---|
| EE T 101(3), 109(1), 114(3), § 117(3), § 118(1), 120(1), EG T 101(1), 102(1), ENGL 015 GWS;DEX(3), ENGR 002(1), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN(3) | X | — |
| CMPSC 101 GQ(3), EE T 205(1), 210(3), 211(4), § CMPET 240(5), 241(4), 242(3), PHYS 151(3), SPCOM 100 GWS (3) | — | X |

ADDITIONAL COURSES (1-3 credits)

Select 1-3 credits from the following technical courses:

| | | |
|---|---|---|
| BI SC 003 GN, CHEM 011, 012 DN, CE T 261, CMPSC 102, EE T 297, MCH T 213, CMPET 297, or ME T 207 | — | X |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (3 credits)

| | | |
|--------------------------------------|---|---|
| Select 3 credits in computer science | — | X |
|--------------------------------------|---|---|

COMPUTER SCIENCE (2CPSC)PROFESSOR M. DEAN FENTON, *in charge*

The primary objective of the two-year Computer Science major is to prepare graduates for immediate and continuing employability as application programmers, associate systems designers, or associate systems programmers.

To meet this objective the major is designed to ensure a thorough knowledge of the techniques of programming general purpose digital computers, and includes extensive practice—using contemporary programming technologies—in the analysis, organization, validation, and documentation of effective computer code. The major also includes practical knowledge of the logical organization of modern digital computers and related peripheral equipment, the structure of operating systems and compilers, and considerations in the design of information systems.

The General Education component provides the student with an extension to the basic educational foundation. The general Requirements for the Major give the graduate technical competence in the computing and data processing field. The Application Specialization provides a practical knowledge of an area of application within which the graduate may profitably utilize the acquired computing talent.

For the Associate in Science degree in Computer Science, a minimum of 64 credits is required.

GENERAL EDUCATION: 21 credits

(9 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See the description of General Education at front of *Bulletin*.)**REQUIREMENTS FOR THE MAJOR: 52 credits**

(This includes 9 credits of General Education courses; 3 credits of GQ courses; 6 credits of GWS courses.)

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

| | <i>Scheduling Recommendation by Semester Standing</i> | |
|--|---|-----|
| | 1-2 | 3-4 |
| PRESCRIBED COURSES (34 credits) | | |
| CMPSC 100(3), 101 GQ(3), 102(3), § 140(3), § | | |
| ENGL 015 GWS;DEX(3), SPCOM 100 GWS(3) | X | X |
| CMPSC 142(3), 144(4), § 154(3), 164(3), 174(2), 175(1) | — | X |
| ADDITIONAL COURSES (6 credits) | | |
| ENGL 202C GWS OR 202D GWS(3) | X | X |
| Select 3 credits from MATH 021 GQ or above | X | X |
| SUPPORTING COURSES AND RELATED AREAS (12 credits) | | |
| Select 9 credits of related courses in a technical specialization in | | |
| consultation with adviser | X | X |
| Select 3 credits in Q B A, STAT, or MATH (above MATH 021 GQ) | X | X |

DIETETIC FOOD SYSTEMS MANAGEMENT (2EDSM)

PROFESSOR ELLEN P. BARBROW, *in charge*

The purpose of the Dietetic Food Systems Management major is to prepare food systems management dietetic technicians for middle management positions in the food service area of health care facilities or community feeding operations. Candidates for admission to this major must be employed at least fifteen hours a week in a health care facility food service operation where their work is supervised by a registered dietitian. Graduates become eligible for technician membership in the American Dietetic Association.

Students who meet admission criteria are admitted to the extended degree major in Dietetic Food Systems Management. The required courses are available primarily through correspondence study offered by the Department of Independent Learning.

Students who achieve outstanding records may, upon completion of this major, apply for admission to the Management Dietetics option of the baccalaureate degree major in Hotel, Restaurant, and Institutional Management in the College of Health and Human Development.

For the Associate in Science degree in Dietetic Food Systems Management, a minimum of 67 credits is required.

| <i>Scheduling Recommendation by Semester Standing</i> | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits

(3 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

ELECTIVES: 3 credits

REQUIREMENTS FOR THE MAJOR: 46 credits

(This includes 3 credits of General Education GS courses.)

| | | |
|---|---|---|
| PRESCRIBED COURSES (37 credits) | | |
| D S M 100(1), § 101(3), § 103(3), § 195(2), § 205(3), § | | |
| 250(4), § 260(4) § | X | X |
| D S M 270(3), § 295(4), § 304(3), § H P A 101(3), NUTR 252(4) § | X | X |

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

| | <i>Scheduling Recommendation by Semester Standing</i> | |
|--|---|-----|
| | 1-2 | 3-4 |
| ADDITIONAL COURSES (6 credits) | | |
| NUTR 151 or 251 GHS(3) [§] | X | X |
| SOC 001 GS or 003 GS(3) | X | X |
| SUPPORTING COURSES AND RELATED AREAS (6 credits) | | |
| Select 6 credits in consultation with the adviser to develop competence as a dietetic practitioner | X | X |

ELECTRICAL ENGINEERING TECHNOLOGY (2 EET)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology
and Commonwealth Engineering, University Park Campus*
PROFESSOR ROBERT BUCZINSKI, *Program Coordinator, Berks Campus*

This major helps prepare graduates for technological service with manufacturers of electrical, electronic, and computer equipment; electrical utilities; and electrical maintenance and instrumentation departments of various industrial concerns. The principal objective is to provide a practical knowledge of electronic, digital, and microprocessor theory as well as electrical machinery and its applications.

Graduates of the Electrical Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology or in Energy Technology offered at Penn State Harrisburg. Or they may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Electrical Engineering Technology, a minimum of 72 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See General Education description in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63-64 credits

(This includes 12 credits of General Education courses: 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (62 credits)

| | | |
|--|---|---|
| CMPSC 101 GQ(3), EE T 101(3), 109(1), 114(3), [§] 117(3), [§] 118(1), [§] 120(1), EG T 101(1), 102(1), ENGL 015 GWS;DEX(3), | | |
| ENGR 002(1), MATH 087 GQ (5), 088 GQ(5) | X | — |
| EE T 204(2), 205(1), 206(1), 210(3), 211(4), 213(3), 215(3), 216(3), 219(1), 221(1), PHYS 150 DN(3), 151(3), | | |
| SPCOM 100 GWS(3) | — | X |

ADDITIONAL COURSES (1-2 credits)

Select 1-2 credits from the following technical courses:

| | | |
|---|---|---|
| BI SC 003 GN, CHEM 011, 012 DN, CE T 261, CMPSC 102, EE T 297, EG T 103, 104, I E 315, IE T 105, MATH 140 GQ, 141 GQ, MCH T 110, or 111 | — | X |
|---|---|---|

[§]A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

FOREST TECHNOLOGY (2 FORT)

PROFESSOR KENNETH J. SWISHER, *in charge*

The objectives of the Forest Technology major are to train forestry field personnel in the technical aspects of evaluating, managing, and protecting forest resources. Practicums held on the Michaux State Forest, adjacent to the campus, stress field applications of classroom theory. Both written and oral communication skills are stressed in all courses. Graduates of the program are employed by businesses including federal and state timber management and recreation programs, urban tree service companies, pulp and paper manufacturers, surveying and landscaping firms, power companies, and other businesses requiring personnel skilled in field data-gathering analysis and presentation.

Some graduates transfer their credits to bachelor degree programs such as business management, wildlife science, forest science, geology, leisure studies, and environmental resource management.

For the Associate in Science degree in Forest Technology, a minimum of 66 credits is required.

| Scheduling Recommendation by Semester Standing | | |
|---|--------|-----|
| 1-2 | Summer | 3-4 |

GENERAL EDUCATION: 21 credits

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 45 credits

PRESCRIBED COURSES (39 credits)

| | | | |
|---|---|---|---|
| FOR 105(3), 137(1), 138(1), 140(2), 141(4), 240(3), 245(2), 250(3) | X | — | — |
| FOR 106(2), 108(1), 822(1) | — | X | — |
| FOR 220(3), 221(1), 242(3), 814(1), 860(1) | — | — | X |
| FOR 234(3), 241(4) | — | — | X |

ADDITIONAL COURSES (6 credits)

| | | | |
|--|---|---|---|
| Select 6 credits from ACCTG 200, FOR 817, WILDL 101, or 207 | — | — | X |
|--|---|---|---|

HOTEL, RESTAURANT, AND INSTITUTIONAL
MANAGEMENT (2HRIM)

JAMES A. BARDI, *Director*

The Hotel, Restaurant, and Institutional Management major is an intensive four-semester major designed to prepare students for managerial positions in the hospitality industry. The course of study places heavy reliance on experience acquired in an on-the-job setting.

Students who achieve outstanding records may, upon completing this program, apply for admission to the baccalaureate degree major in Hotel, Restaurant, and Institutional Management in the College of Health and Human Development. Six or more additional semesters of satisfactory work are required to earn the baccalaureate degree. Graduates of this major may qualify for admission to other baccalaureate degree majors.

For the Associate in Science degree in Hotel, Restaurant, and Institutional Management, a minimum of 66 credits is required.

GENERAL EDUCATION: 21 credits

(3 of these 21 credits are included in REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

*Scheduling Recommendation
by Semester Standing*
1–2 3–4

REQUIREMENTS FOR THE MAJOR: 48 credits
(This includes 3 credits of GWS courses.)

PRESCRIBED COURSES (40 credits)

| | | |
|--|---|---|
| ACCTG 200(3), ENGL 015 GWS;DEX(3), 202D GWS(3), HR&IM 201(2), 204(3), 250(4), 260(4),§ 270(4),§ 295(2), 310(3), 320(3), 337(3), 380(3) | X | X |
|--|---|---|

SUPPORTING COURSES AND RELATED AREAS (8 credits)

| | | |
|---|---|---|
| Select 3 credits in nutrition | X | X |
| Select 5 credits in consultation with adviser to develop a competency in management or general business administration | X | X |

HUMAN DEVELOPMENT AND FAMILY STUDIES (2HDFS)

NANCY J. KURTZ, *Coordinator*

This major integrates practical and academic experiences to provide the student with entry-level professional competence in one of several human service fields. The objective of the major is to offer a general education background, a knowledge base in life span and family development, and a core of professional skills that may be applied in program planning and service delivery activities. The major is offered as an extended degree, permitting part-time, evening, and independent learning course work credits to be earned.

ADULT DEVELOPMENT AND AGING OPTION: This option is designed to prepare students for a wide variety of service roles in nursing homes, area agencies on aging, senior citizen centers, and other sites for services to the elderly.

CHILD AND YOUTH SERVICES OPTION: This option is designed to prepare students for a variety of service roles in day and residential child and youth care systems, preschools, Head Start centers, and other child and youth service settings.

FAMILY SERVICES OPTION: This option is designed to prepare students for employment, under a variety of job titles, in the delivery of family services. Such services are offered across a wide range of settings: day care, Head Start, parent education, family planning, drug and alcohol programs, agencies for the disabled, child, youth, and family health and welfare agencies.

For the Associate in Science degree in Human Development and Family Studies, a minimum of 62 credits is required.

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

ELECTIVES: 2–4 credits

REQUIREMENTS FOR THE MAJOR: 49–51 credits

(This includes 12 credits of General Education courses; 6 credits of GWS courses; 3 credits of GS courses; 3 credits of DH courses.)

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

HUMAN DEVELOPMENT AND FAMILY STUDIES

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 32-33 credits

PRESCRIBED COURSES (26-27 credits)

| | | |
|---|---|---|
| ENGL 015 GWS;DEX(3), HD FS 129 GS;DE(3), PSY 002 GS(3), SPCOM 100 GWS(3) | X | — |
| HD FS 216 DS(3) | X | X |
| H DEV 395(8-9), HD FS 315(3) | — | X |

ADDITIONAL COURSES (6 credits)

| | | |
|---------------------------|---|---|
| PHIL 103 DH or 104 DH(3) | X | — |
| EDPSY 014 or HD FS 200(3) | X | — |

REQUIREMENTS FOR THE OPTION: 17-18 credits

ADULT DEVELOPMENT AND AGING OPTION: 17-18 credits

PRESCRIBED COURSES (6 credits)

| | | |
|-------------------------|---|---|
| HD FS 249 DS(3), 311(3) | X | X |
|-------------------------|---|---|

ADDITIONAL COURSES (2-3 credits)

| | | |
|---|---|---|
| Select 2-3 credits from H P A 101(3), HL ED 060 GHS(3), HD FS 218(3), 219(3), 297(1-3), NUTR 251 GHS(3), PSY 174(3), LE ST 120(3), 236(3), 277(3) | X | X |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (9 credits)

| | | |
|---|---|---|
| Select 9 credits in consultation with the adviser from University-wide offerings that enhance competence in the option. | — | X |
|---|---|---|

CHILD AND YOUTH SERVICES OPTION: 17-18 credits

ADDITIONAL COURSES (8-9 credits)

| | | |
|---|---|---|
| HD FS 229 DS or 239 DS(3) | X | X |
| Select 5-6 credits from HD FS 297(1-2), 330(1-4), HL ED 303 GHS(2), A ED 003 or 014(3), NUTR 251 GHS(3), PSY 213 DS;DE(3) | X | X |

SUPPORTING COURSES AND RELATED AREAS (9 credits)

| | | |
|---|---|---|
| Select 9 credits in consultation with the adviser from University-wide offerings that enhance competence in the option. | — | X |
|---|---|---|

FAMILY SERVICES OPTION: 17-18 credits

PRESCRIBED COURSES (6 credits)

| | | |
|----------------------|---|---|
| HD FS 219(3), 311(3) | X | X |
|----------------------|---|---|

ADDITIONAL COURSES (2-3 credits)

| | | |
|--|---|---|
| Select 2-3 credits from HD FS 218(3), 229 DS, 297(1-3) | X | X |
|--|---|---|

SUPPORTING COURSES AND RELATED AREAS (9 credits)

| | | |
|---|---|---|
| Select 9 credits in consultation with the adviser from University-wide offerings that enhance competence in the option. | — | X |
|---|---|---|

LETTERS, ARTS, AND SCIENCES (2 LAS)

PROFESSOR JEANETTE D. BRAGGER, *in charge*

The objectives of the Letters, Arts, and Sciences major are to broaden the student's understanding, interests, and skills; to help the student become a more responsible, productive member of the family and community; and to offer a degree program with sufficient electives to permit some specialization according to the student's interests or career plans. Letters, Arts, and Sciences is a complete two-year degree major. However, graduates who later seek admission to baccalaureate degree majors may apply baccalaureate credits toward the new degree. Any 800-level credits taken in the Letters, Arts, and Sciences program are not applicable toward most baccalaureate degrees.

In addition to a wide variety of baccalaureate majors offered at University Park Campus, graduates of the Letters, Arts, and Sciences major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Elementary Education, Humanities, or Public Policy offered at Penn State Harrisburg. Or they may qualify for any of a large number of baccalaureate degree majors offered by Penn State Erie, The Behrend College, in business, the liberal arts, and sciences.

For the Associate in Arts degree in Letters, Arts, and Sciences, a minimum of 60 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits[#]

(6 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

ELECTIVES: 15 credits

REQUIREMENTS FOR THE MAJOR: 30 credits[#]

(This includes 6 credits of General Education GWS courses.)

PRESCRIBED COURSES (6 credits)

| | | |
|---------------------|---|---|
| ENGL 015 GWS;DEX(3) | X | — |
| SPCOM 100 GWS(3) | — | X |

ADDITIONAL COURSE (3 credits)

| | | |
|------------------------------|---|---|
| ENGL 202A, B, C, or D GWS(3) | — | X |
|------------------------------|---|---|

SUPPORTING COURSES AND RELATED AREAS (21 credits)

| | | |
|---|---|---|
| Select 3 credits in any course designated as arts* | X | X |
| Select 3 credits in any course designated as humanities* | X | X |
| Select 3 credits in any course designated as social and behavioral sciences* | X | X |
| Select 3 credits in any course designated as physical, biological, or earth sciences* | X | X |
| Select 9 credits in any one of the following areas*: arts, humanities, social and behavioral sciences, natural sciences and quantification, and foreign language skills. (If foreign language courses are chosen, it is recommended that these courses be in one foreign language sequence.) | X | X |

[#]The required credits of General Education and Requirements for the Major must be baccalaureate-level courses. For students intending to seek admission to a baccalaureate program upon graduation, it is recommended that most, if not all, of the courses be at the baccalaureate level. For those students who will seek a Bachelor of Arts degree upon graduation from Letters, Arts, and Sciences, it is strongly recommended that a foreign language be taken since admission to a Bachelor of Arts program in the College of the Liberal Arts requires one college-level course, or the equivalent, in a foreign language.

*Courses that will satisfy the arts, humanities, social and behavioral sciences, natural sciences, and quantification requirements are defined on the Letters, Arts, and Sciences checksheet, which may be obtained from the College of the Liberal Arts associate dean for undergraduate studies at the University Park Campus or from any Letters, Arts, and Sciences representative at the Commonwealth Campuses.

MATERIALS ENGINEERING TECHNOLOGY (2MATE)

PROFESSOR W. MURRAY SMALL, *in charge*

The last decade has seen several remarkable changes occurring within the materials industry. First, the profile has shifted among products of commerce away from metals and toward ceramics and polymers. Second, emphasis on the quality of products has increased, with the implementation of on-line instrumental checks for defects and statistical analysis. Third, awareness has broadened about the importance of materials and manufacturing to a strong U.S. economy. Highly trained materials technicians have significant roles to play in this industry. Their training qualifies them to perform and supervise mechanical property and quality assurance tests on a variety of products. This program is designed to supply the student with extensive laboratory background to these key elements of materials technology. Courses are offered to give the student an exposure to the breadth of materials technology both from the basic side and frequent contact with industry.

For the Associate in Engineering Technology degree in Materials Engineering Technology, a minimum of 64 credits is required.

| <i>Scheduling Recommendation by Semester Standing</i> | | |
|---|--------|-----|
| 1-2 | Summer | 3-4 |

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 55 credits

(This includes 12 credits of General Education courses; 6 credits of GWS courses; 3 credits of DN courses; 3 credits of GQ courses.)

PRESCRIBED COURSES (52 credits)

| | | | |
|---|---|---|---|
| CHEM 012 DN(3), 014 DN(1), CMPSC 101 GQ(3), EG T 101(1), 102(1), ENGL 015 GWS;DEX(3), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN(3), 151(3) | X | — | — |
| ENGL 202C GWS(3), IE T 109(3), MAT T 200(3),§ 201(3),§ 202(3),§ 203(3),§ 204(3),§ SPCOM 100 GWS(3) | — | X | — |

ADDITIONAL COURSES (3 credits)

| | | | |
|--------------------------|---|---|---|
| IE T 112 or MAT T 295(3) | — | — | X |
|--------------------------|---|---|---|

MECHANICAL ENGINEERING TECHNOLOGY (2 MET)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology
and Commonwealth Engineering, University Park Campus*

PROFESSOR DAVID HUGGINS, *Program Coordinator, New Kensington Campus*

This major helps prepare detail or layout drafters and junior designers for manufacturing industries as well as for the many concerns engaged in installation or erection work. The principal objective is to prepare men and women for employment in machine design, tool and die design, or structural layout. Some graduates are involved in technical or industrial sales, become supervisors in light and heavy industry, or enter management-trainee programs.

Graduates of this major may qualify for admission to the baccalaureate degree majors in Mechanical Engineering Technology, Structural Design and Construction Engineering Technology, or Energy Technology offered at Penn State Harrisburg. Or they may qualify for admission to the Mechanical Design and Materials option of the baccalaureate degree majors in either Mechanical or Plastics Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Mechanical Engineering Technology, a

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

minimum of 68 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

*Scheduling Recommendation
by Semester Standing*

1-2 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 59-60 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (57 credits)

| | | |
|---|---|---|
| CMPSC 101 GQ(3), ENGL 015 GWS;DEX(3), EG T 101(1), 102(1), 103(2), 104(1), IE T 101(3),§ MATH 087 GQ(5), 088 GQ(5), MCH T 111(3),§ PHYS 150 DN(3) | X | X |
| IE T 212(2) | — | X |
| EE T 100(3), EG T 201(2), IE T 215(3), MCH T 213(3), 214(1), ME T 206(3),§ 210(3), PHYS 151(3), SPCOM 100 GWS(3) | — | X |

ADDITIONAL COURSES (2-3 credits)

Select 2-3 credits from the following technical courses:

| | | |
|---|---|---|
| AE T 209, 297, CE T 111, 261, 297, EG T 297, IE T 105, 109, 297, ME T 207, 281, or 297 | — | X |
|---|---|---|

MEDICAL LABORATORY TECHNOLOGY (2 MLT)

PROFESSOR PHILIP W. MOHR, *in charge*

This two-calendar-year Medical Laboratory Technology major (four semesters, two summer sessions) is designed to provide the necessary general and technical training for hospital personnel between the level of the medical laboratory technician (certificate program) and the medical technologist (baccalaureate program). The course of study includes one year of intensive clinical experience at an affiliated hospital and the theoretical background necessary for the clinical procedures performed by the certified medical laboratory technician (associate degree program). Upon completion of program requirements, the student receives the associate degree and is eligible to sit for examinations leading to certification and registry as a medical laboratory technician.

Graduates of the Medical Laboratory Technology major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Humanities, or Public Policy offered at Penn State Harrisburg.

For the Associate in Science degree in Medical Laboratory Technology, a minimum of 69 credits is required.

GENERAL EDUCATION: 21 credits

(11-12 of the 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 60-63 credits

(This includes 11-12 credits of General Education courses; 6 credits of GWS courses; 3 credits of GN courses; 2-3 credits of GQ courses.)

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

| | <i>Scheduling Recommendation by Semester Standing</i> | | |
|---|---|---------|-----|
| | 1-2 | Summer* | 3-4 |
| PRESCRIBED COURSES (58-59 credits) | | | |
| BIOL 041 DN(3), 042(1), 101 DN(4), CHEM 012 DN(3-4), 014 DN(1), MICRB 201(3), 202 (2) | X | — | — |
| ENGL 015 GWS;DEX(3), MICRB 150(4), CHEM 034 (3) | X | X | — |
| SPCOM 100 GWS(3) | — | X | — |
| CMPSC 001 (1) | — | X | X |
| MICRB 151A(7), 151B(6), 151C(6), 151D(4), 151E(2), 151F(2) [§] | — | — | X |
| ADDITIONAL COURSES (2-4 credits) | | | |
| Select 2-4 credits from MATH 017 GQ(3), 018 GQ(3), 021 GQ(3), 022 GQ(3), 026 GQ(3), 110 GQ(4), 111 GQ(2), 140 GQ(4), STAT 200 GQ(4), or 250 GQ (3) | X | — | — |

MINING TECHNOLOGY (2MNGT)

PROFESSOR STANLEY C. SUBOLESKI, *in charge*

A student in the Mining Technology major covers a blend of basic sciences, mathematics, communications, arts, humanities, social sciences, and applied courses during the period of study. These courses are sequenced so that basic principles of physical processes are used to understand the specific procedures involved in mining. The curriculum covers a breadth of material at a level consistent with potential careers of mining technology graduates.

This major helps prepare students for either a management-oriented or an engineering-oriented position in the mining industry. Many graduates of this major, after serving the required apprenticeship, become certified managers in their fields.

Graduates of the Mining Technology major may qualify for admission to the baccalaureate degree majors in Energy Technology or in Structural Design and Construction Engineering Technology offered at Penn State Harrisburg.

For the Associate in Engineering Technology degree in Mining Technology, a minimum of 72 credits is required.

MAINTENANCE OPTION: This option prepares students to become maintenance supervisors. Initially, graduates may work as apprentice electricians or mechanics to gain experience in repairs and planned maintenance. After certification is obtained, they may become involved with maintenance planning, working as or with the chief mine mechanic or chief mine electrician.

PRODUCTION OPTION: This option helps prepare students to become mine supervisors or engineering aides. Initially, some of the duties are to run transit and act as survey party chief, keep mine maps up to date and make projections, take samples and run analyses, make time studies, and assist with materials handling layouts.

SURFACE MINING OPTION: This option helps prepare students for work as engineering aides or as supervisors in surface mining. At first, graduates work as assistants to engineers or to other supervisors. After a period of training, graduates may become involved in such areas of mining as pit design, equipment utilization, environmental control, reclamation, and mine laws and regulations.

*Scheduling of courses in summer session depends on campus location.

[§]A student enrolled in this major must receive a grade of C or better in courses MICRB 151A through 151F.

[†]No new students are being accepted into this program.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(15 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 66-67 credits

(This includes 15 credits of General Education courses.)

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 43 credits

PRESCRIBED COURSES (43 credits)

| | | |
|--|---|---|
| CHEM 011(3), ECON 014 GS(3), GEOSC 020 GN(3), SPCOM 100 GWS(3) | X | — |
| CMPSC 101 GQ(3), E G 001(2), ENGL 015 GWS;DEX(3), MATH 087 GQ(5), 088 GQ(5), MCH T 111(3), MNG T 800(1), 804(3), 806(3), PHYS 150 DN(3)* | X | X |

REQUIREMENTS FOR THE OPTION: 23-24 credits

MAINTENANCE OPTION: 24 credits

PRESCRIBED COURSES (24 credits)

| | | |
|--|---|---|
| MNG T 801(3), 802(3), 807(3), 808(3), 809(3), 810(3), 811(3), MGMT 100(3) | — | X |
|--|---|---|

PRODUCTION OPTION: 23 credits

PRESCRIBED COURSES (20 credits)

| | | |
|---|---|---|
| MN PR 061(3), MNG 023(3), 030(2), MNG T 801(3), 802(3), 803(3), 805(3) | — | X |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (3 credits)

| | | |
|---------------------------------------|---|---|
| Select 3 credits in mining technology | — | X |
|---------------------------------------|---|---|

SURFACE MINING OPTION: 24 credits

PRESCRIBED COURSES (21 credits)

| | | |
|---|---|---|
| MN PR 061(3), MNG 023(3), MNG T 815(3), 816(3), 817(3), 818(3), 819(3) | — | X |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (3 credits)

| | | |
|---------------------------------------|---|---|
| Select 3 credits in mining technology | — | X |
|---------------------------------------|---|---|

†NUCLEAR ENGINEERING TECHNOLOGY (2 NET)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology
and Commonwealth Engineering, University Park Campus*

PROFESSOR MASOUD FEIZ, *Program Coordinator, Beaver Campus*

This major is designed to provide technically trained personnel to support the rapidly developing nuclear industry. The wide scope of training helps prepare nuclear technicians for careers in radiation safety, reactor operations, radioisotope handling, nuclear and control instrumentation, fuel fabrication, and health physics. A nuclear technician may work as a radiological safety specialist, engineering aide, or enter training as a reactor operator at a nuclear facility.

*See department for appropriate course.

†No new students are being accepted into this program.

NURSING

Graduates of the Nuclear Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology offered at Penn State Harrisburg. Or they may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Harrisburg or at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Nuclear Engineering Technology, a minimum of 70 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 61 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (61 credits)

| | | |
|---|---|---|
| CHEM 011(3), CMPSC 101 GQ(3), EE T 101(3), 109(1), EG T 101(1), 102(1), ENGL 015 GWS;DEX(3), 202C GWS(3), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN (3), SPCOM 100 GWS(3) | X | — |
| NE T 201(3), 202(4), 203(3), 204(3), 205(2), 212(3), 214(3), 215(3), PHYS 151(3) | — | X |

NURSING (2NURS)

PROFESSOR FREIDA M. HOLT, *Director, School of Nursing*

This major helps prepare graduates for employment primarily in hospitals and long-term care facilities. Graduates provide nursing care to individuals with commonly occurring acute or chronic health problems. After earning the associate degree, students are eligible to take the registered nurse examination for licensure by the State Board of Nursing. National League for Nursing accreditation of the program will be requested following graduation of the first class.

Students must carry liability insurance and have an annual health examination. Students are also responsible for their own transportation to clinical settings. The use of a car may be necessary.

Graduates of this major may qualify for admission to the baccalaureate degree program in Nursing.

For the Associate in Science degree in Nursing, a minimum of 67 credits is required.

GENERAL EDUCATION: 21 credits

(15 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 61 credits[§]

(This includes 15 credits of General Education courses; 3 credits of GN courses; 3 credits of GQ courses; 6 credits of GS courses; 3 credits of GWS courses)

PRESCRIBED COURSES (58 credits)

| | | |
|--|---|---|
| BIOL 029(4), 041 DN(3), 042(1), ENGL 015 GWS;DEX(3), HD FS 129 GS;DE(3), PSY 002 GS(3), SOC 001 GS(3), NURS 101(8), 102(8) | X | — |
| MICRB 106 GN(2), 107 GN(1), NURS 201(9), 202(10) | — | X |

[§]A student enrolled in this major must receive a grade of C or better for all of these courses.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

ADDITIONAL COURSES (3 credits)
Select 3 credits from MATH 021 GQ or above

— X

OCCUPATIONAL THERAPY (2 O T)

PROFESSOR HAROLD E. CHEATHAM, *Head, Counselor Education, Counseling Psychology, and Rehabilitation Services Education*
PROFESSOR HARU HIRAMA, Ed.D., OTR/L, *in charge*

This major helps prepare graduates to be Occupational Therapy Assistants who are qualified to be employed by agencies that provide occupational therapy services. The goal of occupational therapy is to enable the client to be as independent as possible in the daily performance of self-care, productive, and leisure activities. General education, basic science, and occupational therapy courses are followed by supervised field experience. Certification by the American Occupational Therapy Certification Board and state licensure that may be required for employment are separate from degree requirements.

To enter this major, students must have a high school diploma or its equivalent. To be admitted to degree candidacy, the applicant must have completed educational background requirements called Carnegie Units or Secondary School Units. Students are responsible for proof of liability insurance and other requirements specified by the facility providing supervised field experience.

For the Associate in Science degree in Occupational Therapy, a minimum of 68 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 59 credits

(This includes 12 credits of General Education courses; 3 credits of GWS courses; 6 credits of GS courses; 3 credits of DN courses.)

PRESCRIBED COURSES (56 credits)

BIOL 029 (4), 041 DN(3), 042 (1), ENGL 015 GWS;DEX(3),
HD FS 129 GS;DE(3), PSY 002 GS(3), O T 101(3), 103(3),
105(3), 107(3)
HL ED 013 GHS(1), O T 202(2),§ 204(3),§ 206(3),§ 295A(12),
. PSY 243 DS(3), SOC 001 GS(3)

X —
— X

ADDITIONAL COURSES (3 credits)
Select 3 credits in art

X —

PHYSICAL THERAPIST ASSISTANCE (2 PTA)

PROFESSOR RICHARD ST. PIERRE, *in charge*

The Physical Therapist Assistance program helps prepare individuals to become skilled technical health workers who assist the physical therapist in patient treatment. Students develop knowledge and skills in the appropriate use of equipment and exercise associated with various physical therapy treatment modalities. In order to accomplish these tasks, the major utilizes a combination of basic science and nonscience course work coupled with health education courses specifically designed for

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

SCIENCE

the physical therapist assistant. The program culminates with a full semester of clinical experience.

To enter this major, students must have a high school diploma and satisfactory Scholastic Aptitude Test scores.

The size of each entering class is limited so that optimal clinical experiences and practical application situations can be maintained. Students are admitted into the program only during the fall semester and must progress through the program in the prescribed manner. Clinical affiliations are maintained over a wide geographical area. Students may be required to make special housing and transportation arrangements during the clinical phase.

For the Associate in Science degree in Physical Therapist Assistance, a minimum of 68 credits is required.

| Scheduling Recommendation by Semester Standing | | |
|---|-----|---|
| 1-2 | 3-4 | 5 |

GENERAL EDUCATION: 21 credits
(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 59 credits
(This includes 12 credits of General Education courses; 6 credits of GWS courses; 3 credits of GN courses; 3 credits of GS courses.)

| PRESCRIBED COURSES (59 credits) | | | |
|---|---|---|---|
| BIOL 029(4), 041 DN(3), 042(1), ENGL 015 GWS;DEX(3), HL ED 100(3), 270(3), 384(3),§ PHYS 001 GN(3) | X | — | — |
| ENGL 202C GWS(3), HL ED 150(2),§ 160(2), 250(3), 260(2), 280(3), 303(3),§ PSY 002GS(3), SPCOM 100A GWS(3) | — | X | — |
| HL ED 395E(4),* 395F(4),* 395G(4)* | — | — | X |

SCIENCE (2SC)

PROFESSOR GARY MULLEN, *in charge*

The Science major is designed primarily to provide for the basic educational needs of students who want to pursue professional programs in various medically related fields. The program provides a fundamental group of science courses of value to those who seek positions in government or industry where such knowledge is necessary or desirable.

The Radiologic Technologist Radiographer option requires seven semesters (five semesters and two summer sessions) of formal classroom and clinical education. In the clinical practicum, the student is required to demonstrate competency in performing examinations under supervision in the radiology department of a participating hospital. This generally requires between 1,800 and 2,400 clock hours. In addition to receiving the Associate in Science degree, the student who successfully completes the major is eligible to take the American Registry of Radiologic Technologists (ARRT) examination for certification.

Graduates of the General option of the Science major may qualify for admission to the baccalaureate degree major in Mathematical Sciences offered at Penn State Harrisburg.

For the Associate in Science degree in Science, a minimum of 66 credits is required.

GENERAL EDUCATION: 21 credits
(12-15 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 57-65 credits

*Courses that include clinical education experiences may require the student to travel long distances or obtain housing near the assigned clinic. Housing and transportation arrangements are the responsibility of the student.
§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

(This includes 12–15 credits of General Education courses. For the Biotechnology option: 3 credits of DN courses; 3 credits of GQ courses; 3 credits of GS courses; 6 credits of GWS courses. For the General and RTR options: 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

*Scheduling Recommendation
by Semester Standing*

| 1–2 | 3–4 | 5–6 | 7 |
|-----|-----|-----|---|
|-----|-----|-----|---|

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 13 credits

PREScribed COURSES (13 credits)

| | | | | |
|-----------------------------------|---|---|---|---|
| BIOL 101 DN(4), § PHYS 150 DN(3)§ | X | — | — | — |
| ENGL 015 GWS;DEX(3) | X | X | — | — |
| PHYS 151(3)§ | — | X | — | — |

REQUIREMENTS FOR THE OPTION: 44–52 credits

BIOTECHNOLOGY OPTION: 48 credits

PREScribed COURSES (48 credits)

| | | | | |
|--|---|---|---|---|
| CHEM 012 DN(3), 013 DN(3), 014 DN(1), 015 DN(1), ENGL 202C GWS (3), MATH 026 GQ(3), MICRB 201(3), 202(2), STAT GQ(4) | X | — | — | — |
| BIOCH 001 GN(3), CHEM 034(3), 035(3), MICRB 231(3), § 120(4), § 121A(3), § 121B(3), § SOC 005 GS(3) | — | X | — | — |

GENERAL OPTION: 44 credits

PREScribed COURSES (23 credits)

| | | | | |
|--|---|---|---|---|
| BIOL 029(4), CHEM 011(3), MATH 110 GQ(4) | X | — | — | — |
| BIOL 041 DN(3), CMPSC 101 GQ(3), MICRB 106 GN(2), 107 GN(1), SPCOM 100 GWS(3) | — | X | — | — |

ADDITIONAL COURSES (18 credits)

| | | | | |
|-----------------------------|---|---|---|---|
| MATH 021 GQ or 026 GQ(3) | X | — | — | — |
| CHEM 034 or BIOCH 001 GN(3) | — | X | — | — |

Select 12 credits from the following biological, mathematical, and physical science courses:

| | | | | |
|---|---|---|---|---|
| ASTRO 001 GN(3), BIOL 033 DN(3), 042(1), 102 DN(4), BI SC 003 GN(3), CHEM 035(3), 102(3), MATH 111 GQ(2), PHIL 212 GQ(3), PHYS 297(3), or STAT 200 GQ(4) | X | X | — | — |
|---|---|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (3 credits)

| | | | | |
|--|---|---|---|---|
| Select 3 credits from social and behavioral sciences | X | X | — | — |
|--|---|---|---|---|

RADIOLOGIC TECHNOLOGIST RADIOGRAPHER OPTION: 52 credits

PREScribed COURSES (52 credits)

| | | | | |
|---|---|---|---|---|
| BIOL 029(4), 033 DN(3), CHEM 011(3), CMPSC 100(3), HUMAN 101 DH(3), MATH 021 GQ(3), 026 GQ(3), PHYS 297(3), R T R 101(3), § 102(3)§ | X | — | — | — |
| BIOL 041 DN(3), R T R 103(3), § 104(3), § SPCOM 100 GWS (3) | — | X | — | — |
| R T R 105(3), § 106(3)§ | — | — | X | — |
| R T R 107(3)§ | — | — | — | X |

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

SOCIOLOGY (2ESOC)

PROFESSOR JOSEPH FAULKNER, *in charge*

This major introduces students to the study of human groups and their relationships to each other and to the environment. It enables students to gain some proficiency in the scientific study of group structures and processes. A further objective is to help students become more skillful in working with community institutions, agencies, and organizations either through gainful employment or as a volunteer. Graduates may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Humanities, or Public Policy offered at Penn State Harrisburg.

For the Associate in Arts degree in Sociology, a minimum of 60 credits is required.

| <i>Scheduling Recommendation by Semester Standing</i> | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits

(See description of General Education in front of *Bulletin*.)

ELECTIVES: 9 credits

REQUIREMENTS FOR THE MAJOR: 30 credits

| | | |
|---|---|---|
| PRESCRIBED COURSES (6 credits) | | |
| SOC 001 GS(3) | X | — |
| SOC 007(3) | — | X |
| ADDITIONAL COURSES (12 credits) | | |
| Select 12 credits from SOC 003 GS, 005 GS, 012 DS, 013 DS, 015 DS, 023 DS, 030 DS, 047, 055 DS | X | X |
| SUPPORTING COURSES AND RELATED AREAS (12 credits) | | |
| Select 12 credits in arts, humanities, social and behavioral sciences | X | X |

SURVEYING TECHNOLOGY (2 SRT)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology
and Commonwealth Engineering, University Park Campus*
PROFESSOR CHARLES GHILANI, *Program Coordinator, Wilkes-Barre Campus*

The objectives of the major are to provide a knowledge of the elements of surveying as applied to construction, land, topographic, geodetic, city, and photogrammetric surveys, and to develop trained personnel who understand the relation between the precision of measurements and the interpretation of data in addition to having an appreciation of the skills and equipment needed to make precise measurements in the field of surveying.

Graduates of the Surveying Technology major may qualify for admission to the baccalaureate degree major in Structural Design and Construction Engineering Technology offered at Penn State Harrisburg.

For the Associate in Engineering Technology degree in Surveying Technology, a minimum of 72 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

| Scheduling Recommendation by Semester Standing | | |
|---|--------|-----|
| 1-2 | Summer | 3-4 |

REQUIREMENTS FOR THE MAJOR: 63-64 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (61 credits)

| | | | |
|--|---|---|---|
| CE T 109(2), § 111(3), § 112(3), 118(2), EG T 101(1), 102(1), ENGL 015 GWS;DEX(3), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN(3), 151(3) | X | — | — |
| CE T 210(3), 214(2), 215(3), 216(3), § 290(3), CMPSC 101 GQ(3), EG T 103(2), 104(1), ENGL 202C GWS(3), SPCOM 100 GWS(3) | — | X | — |
| CE T 113(4) | — | — | X |

ADDITIONAL COURSES (2-3 credits)

Select 2-3 credits from the following technical courses:

| | | | |
|---|---|---|---|
| CE T 217, 261, 297, CHEM 011, 012 DN, CMPSC 102, EE T 100, EG T 201, 297, IE 315, IE T 105, MATH 140 GQ, 141 GQ, 231, or ME T 111 | — | — | X |
|---|---|---|---|

TELECOMMUNICATIONS TECHNOLOGY (2TELT)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology
and Commonwealth Engineering, University Park Campus*

PROFESSOR HAROLD GROFF, *Program Coordinator, Wilkes-Barre Campus*

The field of telecommunications includes the transmission of voice and digital signals by telephone, telegraph, radio, television, and satellite. Graduates of the Telecommunications Technology major can become engineering technicians who help select, design, install, operate, maintain, troubleshoot, and repair modern telecommunications systems. Future uses for telecommunications systems include electronic mail, electronic shopping, home computer terminal tie-ins, remote utility meter reading, and the transmission of biomedical data between hospitals, libraries, and doctors' offices.

Graduates of the Telecommunications Technology major may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Harrisburg or Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Telecommunications Technology, a minimum of 72 credits is required.

| Scheduling Recommendation by Semester Standing | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63-65 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (62 credits)

| | | |
|---|---|---|
| CMPSC 101 GQ(3), EE T 101(3), 109(1), 114(3), 118(1), 205(1), 210(3), EG T 101(1), 102(1), ENGL 015 GWS;DEX(3), ENGR 002(1), MATH 087 GQ(5), 088 GQ(5), TELCM 140(2) | X | — |
|---|---|---|

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

WILDLIFE TECHNOLOGY

| | Scheduling Recommendation by Semester Standing | |
|--|---|-----|
| | 1-2 | 3-4 |
| EE T 117(3), 120(1), 211(4), § 216(3), 221(1), PHYS 150 DN(3), 151(3), SPCOM 100 GWS(3), TELCM 241(3), 242(1), 243(3), § 244(1) | — | X |
| ADDITIONAL COURSES (1-3) Select 1-3 courses from the following technical courses: BE T 297, CE T 261, CMPSC 102, EE T 211, 213, 297, EG T 203, I E 315, MCH T 111, ME T 207 | — | X |

WILDLIFE TECHNOLOGY (2 WLT)

PROFESSOR MICHAEL J. LACKI, *in charge*

The Wildlife Technology major helps prepare students in the techniques of wildlife management. Personnel trained in this field are needed to assist in the applied phases of natural resource management, wildlife biology, range management, and the care, maintenance, and propagation of animals. Graduates should be able to support professionals in wildlife biology, park managers, game refuge managers, and laboratory technicians in research.

For the Associate in Science degree in Wildlife Technology, a minimum of 65 credits is required.

| | Scheduling Recommendation by Semester Standing | |
|---|---|-----|
| | 1-2 | 3-4 |
| GENERAL EDUCATION: 21 credits (See description of General Education in front of <i>Bulletin</i> .) | | |

REQUIREMENTS FOR THE MAJOR: 44 credits

| | | |
|---|---|---|
| PRESCRIBED COURSES (44 credits) | | |
| CE T 109(2), FOR 240(3), 250(3), WILDL 101(3), 103(3), 106(4) | X | — |
| AG 113(1), FOR 242(3), HL ED 013 GHS(1), WILDL 204(4), 207(3), 208(3), 209(4), 211(4), 213(3) | — | X |

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

COURSE DESCRIPTIONS

CREDITS AND HOURS

Credits are awarded on the semester-hour basis. According to Senate Policy 42-23, a total of at least forty hours of work planned and arranged by the University faculty is required for the average student to gain 1 credit. While the distribution of time varies from course to course, generally, one-third of the time is devoted to formal instruction, such as lecture, recitation, laboratory, field trips, etc., and two-thirds of the time to outside preparation.

Credits, classroom work, and practicum or laboratory work are indicated by three numbers in parentheses immediately following the course title—for example (3:3:0):

1. The first number shows the maximum credits authorized for the course.
2. The second number shows the periods of classroom work (including lecture, recitation, class discussion, demonstration, or various combinations of these).
3. The third number shows the periods of practicum work (including laboratory, shop work, studio, drafting room, field trips, etc.).

A typical class period is fifty minutes.

Courses numbered from 1 to 399 carry baccalaureate credit and are required in most of the associate degree majors. Elective credit courses vary from campus to campus and semester to semester, and all of the courses listed here are not offered at each campus. Students can obtain information about the specific course offerings for a given campus from the appropriate *Schedule of Classes*. Descriptions of prerequisite courses listed here by number only may be found in the *Baccalaureate Degree Programs Bulletin*.

COURSE SUFFIXES

GENERAL EDUCATION—The following suffixes are used in the course description section to designate courses that have been approved for General Education:

Skills Courses

- Writing/Speaking—GWS
- Quantification—GQ
- Health Sciences—GHS
- Physical Education—GPE

Breadth Courses

- Natural Sciences—GN
- Arts—GA
- Humanities—GH
- Social and Behavioral Sciences—GS

Depth Courses

- Natural Sciences—DN
- Arts—DA
- Humanities—DH
- Social and Behavioral Sciences—DS

CULTURAL DIVERSITY—The following suffixes are used in the course description section to designate courses that have been approved to help fulfill the cultural diversity requirement for baccalaureate degree students: DF—diversity focused; DE—diversity enhanced; and DEX—diversity enhanced by section.

WRITING ACROSS THE CURRICULUM—Courses with a W suffix may be used toward fulfilling this requirement.

ACCOUNTING (ACCTG)

150. INTERMEDIATE ACCOUNTING (3:3:0) Financial accounting statements, concepts, and procedures; assets, liabilities, owners' equity, statement analysis. Students may not receive credit for both ACCTG 150 and 471. Prerequisite: ACCTG 200.

AGRICULTURAL ECONOMICS

160. COST ACCOUNTING (3:3:0) Use of standard cost accounting procedures to present cost and budget statements as a means of providing managerial control. Students may not receive credit for both ACCTG 160 and 404. Prerequisite: ACCTG 200.

170. NOT FOR PROFIT ACCOUNTING (3:3:0) Accounting procedures designed to meet the environmental characteristics of nonprofit and governmental entities. Prerequisite: ACCTG 200.

200. INTRODUCTORY FINANCIAL ACCOUNTING (3:2½:1) Fundamentals of the collection, recording, summarization, and interpretation of accounting data.

204. INTRODUCTORY MANAGERIAL ACCOUNTING (3:2½:1) Actual and standard cost systems; managerial uses of cost data. Prerequisite: ACCTG 200.

AGRICULTURAL ECONOMICS (AG EC)

101. (DS) INTRODUCTION TO AGRICULTURAL ECONOMICS (3:3:0) Application of economic principles to resource allocation problems in the production, marketing, and consumption of food and agricultural products. Not open to students in the Agricultural Economics and Rural Sociology or Agricultural Business Management majors or students who have completed ECON 302 DS.

102. INTRODUCTION TO FOOD AND AGRICULTURAL MARKETING (3:3:0) Comprehensive theoretical and descriptive survey of farm and food products marketing from the perspective of producers, marketing middlemen, and consumers.

106. INTRODUCTION TO FARM MANAGEMENT (3:3:0) Organizing and operating farm businesses for financial success; measuring profits; improving efficiency of labor, land, capital; getting started in farming.

200. INTRODUCTION TO AGRICULTURAL BUSINESS MANAGEMENT (3:3:0) Application of management principles and processes to agricultural business firms in their planning and operating in domestic and international markets.

208. FARM RECORDS AND ACCOUNTS (3:2:2) Practice in keeping, analyzing, interpreting records; systems of accounts to meet needs of individual farm situations.

232. MARKETING DAIRY PRODUCTS (3:3:0) Economics of marketing dairy products; factors affecting price, production, and utilization of milk; role of cooperatives; price plans and policies.

297. SPECIAL TOPICS (1-9)

AGRICULTURE—GENERAL (AG)

113. EXPLORING CAREERS IN AGRICULTURE (1:1:0) Examination of career opportunities in agriculture with an exploration of the relationship between student interest and career decisions.

AGRONOMY (AGRO)

028. PRINCIPLES OF CROP MANAGEMENT (3:2:2) Biological and agronomic principles applied to production and management of major feed and forage crops of the northeastern United States. Prerequisites: 6 credits in biological science.

AMERICAN STUDIES (AM ST)

100. (GH) INTRODUCTION TO AMERICAN STUDIES (3:3:0) A study of selected attempts to identify and interpret movements and patterns in American culture. Prerequisite: third-semester standing.

105. (DH;DF) AMERICAN POPULAR CULTURE AND FOLKLIFE (3:3:0) Survey of popular culture, folklife, and ethnicity, synthesizing material from such areas as literature, media, entertainment, print, music, and film.

196. (ENGL 196) INTRODUCTION TO AMERICAN FOLKLORE (3:3:0) A basic introduction to verbal and nonverbal folklore stressing the basic procedures of collection, classification, and analysis.

197. (ENGL 197) AMERICAN FOLK SONG IN ENGLISH (3:3:0) British songs in America; native repertoires, white and black; folk ballad; and musical development.

ANIMAL SCIENCE (AN SC)

007. HORSE PRODUCTION AND MANAGEMENT (3:2:2) Principles of selection, breeding, feeding, management, and marketing of horses; emphasis on light leg horses.

100. ANIMAL AGRICULTURE (3:2:2) Magnitude, importance, and complexity of the beef, dairy, horse, poultry, sheep, and swine industries, with particular emphasis on Pennsylvania agriculture.

201. MEAT ANIMAL MANAGEMENT (3:3:0) Principles of nutrition, breeding, physiology, health, and marketing applied to improving the performance and efficiency of meat production. Not intended for animal production majors.
202. DAIRY SCIENCE AND INDUSTRY (3:2:2) Introduction to dairy industry; milk composition, production, marketing. Dairy cattle breeding, feeding, housing, husbandry, management, and selection. Intended for non-dairy production majors.

ANTHROPOLOGY (ANTH)

001. (GS) INTRODUCTORY ANTHROPOLOGY (3:3:0) Prehistoric and traditional peoples and cultures; traditional customs and institutions compared with those of modern society.
002. (GS) INTRODUCTION TO ARCHAEOLOGY (3:3:0) This course surveys basic approaches used by archaeologists to interpret prehistoric human cultural patterns.
008. (DS;DF) AZTECS, MAYAS, AND INCAS (3:3:0) Comparative survey of the development of the pre-Columbian Latin American civilizations.
009. (DS) RISE OF CIVILIZATION IN THE OLD WORLD (3:3:0) Evolution of Old World complex societies, especially the first great civilizations of Mesopotamia, Egypt, China, and the Indus Valley.
011. (DS;DF) INTRODUCTORY NORTH AMERICAN ARCHAEOLOGY (3:3:0) Introduction to archaeology of the North American Indians; site methods, and results of research interpreted in cultural history.
021. (GN) INTRODUCTORY BIOLOGICAL ANTHROPOLOGY (3:3:0) The role of human biology and evolution in culture, society, and behavior.
045. (GS) CULTURAL ANTHROPOLOGY (3:3:0) Beginnings of human culture; economic life, society, government, religion, and art among traditional peoples.
146. (DS;DF) NORTH AMERICAN INDIANS (3:3:0) An introduction to the cultures of the indigenous peoples of North America, north of Mexico, and the effect of contact.

ARABIC (ARAB)

001. ELEMENTARY MODERN STANDARD ARABIC I (4:3:2) Introduction to reading, writing, pronunciation, and aural comprehension of modern standard Arabic; simple grammatical forms; basic vocabulary.
002. ELEMENTARY MODERN STANDARD ARABIC II (4:3:2) Continued audio-lingual practice in class and language laboratory of modern standard Arabic; continuation of grammar and vocabulary building. Prerequisite: ARAB 001.
003. INTERMEDIATE MODERN STANDARD ARABIC (4:3:2) Continued audio-lingual practice in class and language laboratory of modern standard Arabic; complex grammatical forms, vocabulary building principles. Prerequisite: ARAB 002.
296. INDEPENDENT STUDIES (1–18)
297. SPECIAL TOPICS (1–9)

ARCHITECTURAL ENGINEERING TECHNOLOGY (AE T)

101. BUILDING MATERIALS (3:3:0) Structural and architectural use of building materials and construction assemblies.
102. METHODS OF CONSTRUCTION (3:1:5) Materials and methods of construction used in buildings, as expressed in drawings. Prerequisite or concurrent: AE T 101, EG T 101 and 102.
103. PLUMBING AND FIRE PROTECTION (3:2:2) Layout of plumbing and fire protection in buildings to meet code and usage requirements. Prerequisite or concurrent: AE T 102.
113. SITE PLANNING (2:1:2) Energy conservation through optimum site utilization, contours, cut and fill calculations, storm drainage, spot grading, and finish grading.
204. HEATING, VENTILATING, AND AIR CONDITIONING LAYOUT (3:2:2) Fundamental calculations and layout of systems in buildings. Prerequisite: AE T 103. Prerequisite or concurrent: AE T 102.
206. ARCHITECTURAL PRESENTATION (2:1:2) Visual communication through architectural presentation drawings. Line, value, color, and composition. Prerequisite: E G 001 or 003.
207. ADVANCED CONSTRUCTION METHODS (3:1:5) Integration of materials and systems in working drawings. Prerequisite: fourth-semester standing.
209. STRUCTURE DESIGN (3:2:3) Elementary principles of structural design and detailing in timber, steel, and reinforced concrete; use of handbooks; fundamentals of structural and architectural drafting. Prerequisites: AE T 102, MCH T 213, or EG T 201.

210. ARCHITECTURAL ENGINEERING OFFICE PRACTICE (3:3:0) Procedures involved in production of contract documents, both drawings and specifications. Prerequisite: fourth-semester standing.
212. BUILDING LIGHTING AND ELECTRICAL LAYOUT (3:2:2) Layout of lighting and electrical distribution in buildings.
214. STEEL CONSTRUCTION (3:2:2) Strength of materials as applied to the design of simple steel structures. Prerequisites: AE T 102, MCH T 111.
215. CONCRETE CONSTRUCTION (3:2:2) Fundamentals of design and construction of reinforced concrete structures. Prerequisites: AE T 102, MCH T 111.
297. SPECIAL TOPICS (1–9)

ART (ART)

001. (GA) THE VISUAL ARTS AND THE STUDIO: AN INTRODUCTION (3:3:0) Introduction to the visual arts; the practice of the visual arts; social, cultural, and aesthetic implications of studio activity.
100. (GA) CONCEPTS AND CREATION IN THE VISUAL ARTS (3:1:4) A study of the personal and cultural foundations of artistic creation and practice of creative production in the art studio.
110. IDEAS AS VISUAL IMAGES (3:2:4) Introduction to relationships between visual images and ideas from which they are derived; visual languages, organizational systems, and contextual associations.
111. IDEAS AS OBJECTS (3:2:4) Introduction to the relationship between ideas and the creation of three-dimensional objects.
120. BEGINNING DRAWING (3:2:4) The study and practice of basic drawing as a way of understanding and communicating.
130. (DA) INTRODUCTION TO SCULPTURE I (3:2:4) An introduction to sculpture consisting of lectures, demonstrations, and basic studio work coordinated to cover a broad range of processes.
215. (DA) INTRODUCTORY FIBER ARTS (3:1:5) Theory development and introduction to fiber arts, with emphasis on the loom and nonloom textile art processes.
217. (DA) BEGINNING METAL ARTS (3:2:4) Introduction to fundamental jewelry-making and small-scale metalsmithing processes, including conceptualization, fabrication, surface treatment, and finishing of metalwork. Prerequisites: ART 110, 111, 120, 122W.
223. DRAWING: TECHNIQUES, MATERIALS, AND TOOLS (3:2:4) Drawing with an emphasis on organization and the development of drawing skills through a variety of techniques, materials, and tools. Prerequisites: ART 110, 111, 120, 122W.
240. BEGINNING PRINTMAKING: INTAGLIO (3:2:4) Instruction and practice in the fundamentals of the intaglio process; its relationship to the design and meaning of the print. Prerequisites: ART 110, 111, 120, 122W.
241. BEGINNING PRINTMAKING: LITHOGRAPHY (3:2:4) Instruction and practice in the fundamentals of the lithographic process; its relationship to the design and meaning of the print. Prerequisites: ART 110, 111, 120, 122W.
250. BEGINNING OIL PAINTING (3:2:4) The materials and techniques of painting in oil and their uses in creative painting on panels and canvas. Prerequisites: ART 110, 111, 120, 122W.
251. ACRYLIC PAINTING (3:2:4) Introduction to the materials and techniques of creative painting with acrylic paints.
260. BEGINNING WATERCOLOR PAINTING (3:2:4) Transparent watercolor painting on various papers; knowledge of materials, development of skills and creativity. Prerequisites: ART 110, 111, 120, 122W.
270. (DA) BEGINNING GRAPHIC DESIGN (3:2:4) Orientation to graphic design and the methods of the designer; experimentation in language and visual symbolism in communication of ideas.
280. BEGINNING CERAMICS (3:2:4) The fundamentals of ceramics, throwing, hand building, and glazing; acquainting the student with ceramic materials, techniques, and philosophy. Prerequisites: ART 110, 111, 120, 122W.
290. (DA) BEGINNING PHOTOGRAPHY (3:2:4) Fundamental black–white techniques. Introduction to inherent qualities of photographic vision through study of historic/contemporary photography. Camera, light meter required.
296. INDEPENDENT STUDIES (1–18)

ART EDUCATION (A ED)

003. THE VISUAL ARTS IN THE ELEMENTARY SCHOOL (3:2:2) Understanding of children's art; development of some confidence in the student's own creative approach in the visual arts.
014. INTRODUCTORY CRAFTS FOR TEACHERS (3:1:5) Direct experience with materials such as wood, clay, metal, paper, textiles, and plastics in relationship to the creative needs of children.

ART HISTORY (ART H)

100. (GA) INTRODUCTION TO ART (3:3:0) An approach to the understanding of art through a critical analysis of selected works of architecture, painting, and sculpture. Students who have passed ART H 110 may not schedule this course.

110. SURVEY OF WESTERN ART (3:3:0) General survey of major developments in architecture, painting, and sculpture in the Western world. Students who have passed ART H 100 GA may not schedule this course.

111. (GA) SURVEY OF WESTERN ART I (3:3:0) Survey of the major monuments and trends in the history of art from prehistory through the late Gothic period. Students who have passed ART H 110 may not schedule this course.

112. (GA) SURVEY OF WESTERN ART II (3:3:0) Survey of the major monuments and trends in the history of art from the Renaissance to the modern era. Students who have passed ART H 110 may not schedule this course.

120. (GA) SURVEY OF EASTERN ART (3:3:0) A general survey of the great periods of art in India, Central Asia, China, Japan, and the Islamic world.

211. (DA) ANCIENT ARCHITECTURE (3:3:0) Architecture of Egypt, the Ancient Near East, Greece, and Rome.

212. (DA) MEDIEVAL ARCHITECTURE (3:3:0) Architecture of the Christian church from its origin until the Renaissance, with special attention to medieval construction and design.

213. (DA) RENAISSANCE–BAROQUE ARCHITECTURE (3:3:0) Survey of architecture from the fifteenth through the eighteenth century in Western Europe.

214. (DA) MODERN ARCHITECTURE (3:3:0) Architecture and related arts of sculpture and painting from the end of the eighteenth century to the present day.

301. (DA) EGYPTIAN AND MESOPOTAMIAN ART (3:3:0) Art of the Ancient Near East, including Egypt, Mesopotamia, and neighboring civilizations.

303. (DA) ITALIAN RENAISSANCE ART (3:3:0) The major arts in Italy from the thirteenth century A.D. through the Renaissance; emphasis on sculpture and painting.

304. (DA) SOUTHERN BAROQUE PAINTING (3:3:0) Seventeenth-century painting in Italy, France, and Spain. Emphasis will be on Italy as the vanguard country.

305. (DA) EUROPEAN ART FROM 1780–1860 (3:3:0) A survey of painting and sculpture in Europe from the beginnings of Neoclassicism through the Realist movement. Prerequisite: ART H 100 GA, 110, or 112 GA.

306. (DA) ENGLISH ART (3:3:0) Survey of English art, emphasizing the Middle Ages and the eighteenth and early nineteenth centuries.

307. (DA) AMERICAN ART (3:3:0) History of art in the English colonies and the United States from the seventeenth century to the present.

311. (DA) GREEK AND ROMAN ART (3:3:0) Greek and Roman art, with emphasis on painting and sculpture.

312. (DA) ROMANESQUE AND GOTHIC ART (3:3:0) Survey of the architecture, sculpture, and painting of the Christian church in western Europe from 1000 to 1500.

313. (DA) NORTHERN RENAISSANCE ART (3:3:0) Art in northern Europe in the fifteenth and sixteenth centuries, emphasizing painters such as Van Eyck, Dürer, and Bruegel.

314. (DA) ART IN THE AGE OF REMBRANDT (3:3:0) Dutch and Flemish painting in the seventeenth century.

320. (DA) CHINESE ART (3:3:0) A general survey of the great periods of Chinese art from the Shang dynasty until the modern period.

324. (DA) ROCOCO ART (3:3:0) Eighteenth-century art in western Europe, with emphasis on artists such as Watteau, Fragonard, Falconet, Le Gros, Tiepolo, Guardi, Neumann.

325. (DA) MODERN ART IN EUROPE: SURVEY FROM IMPRESSIONISM TO SURREALISM (3:3:0) A survey of European painting and sculpture from ca. 1850 to ca. 1940. Prerequisite: ART H 100 GA, 110, or 112 GA.

330. (DA) ISLAMIC ART (3:3:0) Survey of the art and architecture of Islamic lands from the late seventh century until the eighteenth century.

342. (DA) RUSSIAN ART AND ARCHITECTURE (3:3:0) Survey of Russian art and architecture from the foundation of the Russian state through the Soviet era.

THE ARTS (ARTS)

001. (GA) THE ARTS (3:3:0) Develop critical perception, knowledge, and judgments through an examination of the basic concepts common among the arts.

005. (GA) PERFORMING ARTS (3:2:3) Introduction to music, dance, and theatre. Orientation to the aesthetics, theory, and practice of professional performance.

296. INDEPENDENT STUDIES (1–18)

ASTRONOMY AND ASTROPHYSICS (ASTRO)

001. (GN) ASTRONOMICAL UNIVERSE (3:3:0) Nonmathematical description of the astronomical universe and the development of scientific thought. For nonscience majors. Students who have passed ASTRO 090 GN may not schedule this course.

* 010. (GN) ELEMENTARY ASTRONOMY (2:2:0) Nonmathematical description of stars, planets, galaxies, and the universe. For nonscience majors. Students who have passed ASTRO 001 GN or 090 GN may not schedule this course.

* 011. (GN) ELEMENTARY ASTRONOMY LABORATORY (1:0:2) Selected experiments and data analysis to illustrate major astronomical principles and techniques. Telescopic observations of stars and galaxies. For non-science majors. Prerequisite or concurrent: ASTRO 001 GN or 010 GN.

090. (GN) DESCRIPTIVE ASTRONOMY (3:2:2) Nonmathematical presentation of methods and results of astronomical exploration of the solar system, stars, and galaxies. For nonscience majors. Students who have passed ASTRO 001 GN may not schedule this course.

291. (DN) ASTRONOMY OF THE SOLAR SYSTEM (3:3:0) Methods and instruments of the astronomer and results obtained by applying them to our solar system. Prerequisite or concurrent: MATH 140 GQ.

292. (DN) ASTRONOMY OF STELLAR SYSTEMS (3:3:0) Methods of study and knowledge of the universe beyond the limits of the solar system. Prerequisites or concurrent: MATH 140 GQ.

BIOCHEMISTRY (BIOCH)

001. (GN) BIOCHEMICAL SCIENCE (3:3:0) Biochemistry of important functions of humans and animals, including genetics, nutrition, metabolic and disease processes, and environmental relationships.

BIOLOGICAL SCIENCE (BI SC)

001. (GN) STRUCTURE AND FUNCTION OF ORGANISMS (3:3:0) Origin, development, and cellular basis of life; fundamental principles, processes, and structures of organisms. Students who have passed BIOL 027, 041 DN, 101 DN, or 102 DN may not schedule this course.

002. (GN) GENETICS, ECOLOGY, AND EVOLUTION (3:3:0) How living organisms pass on their inheritance, how plants and animals came to be what they are, and how they now react. Students who have passed BIOL 033 DN, 101 DN, 102 DN, or 222 may not schedule this course.

003. (GN) ENVIRONMENTAL SCIENCE (3:3:0) Kinds of environments; past and present uses and abuses of natural resources; disposal of human wastes; prospects for the future. Students who have passed BIOL 210 or any other upper-level ecology course in biology may not schedule this course.

004. (GN) HUMAN BODY: FORM AND FUNCTION (3:3:0) A general survey of structure and function—from conception, through growth and reproduction, to death. Students who have passed BIOL 029 and 041 DN may not schedule this course.

BIOLOGY (BIOL)

027. (GN) INTRODUCTION TO PLANT BIOLOGY (3:2:2) Cellular structure and organization; physiological processes; classification; reproduction and development; relationship of plant groups. Students who have passed BIOL 102 DN may not schedule this course.

029. MAMMALIAN ANATOMY (4:2:4) Anatomy of a mammal, with special reference to that of man. Students who have passed BIOL 421 may not schedule this course.

033. (DN) GENETICS AND EVOLUTION OF THE HUMAN SPECIES (3:3:0) Human heredity and evolution, individual and social implications. Students who have passed BIOL 472 may not schedule this course.

041. (DN) PHYSIOLOGY (3:3:0) Normal functions of the animal body, with special reference to those of man. Students who have passed BIOL 472 may not schedule this course.

042. PHYSIOLOGY LABORATORY (1:0:2) Experiments demonstrating basic physiological principles, with special reference to humans. Prerequisite or concurrent: BIOL 041 DN.

101. (DN) PRINCIPLES OF BIOLOGY I (4:3:2) Introduction to cell biology; biology of vertebrates; overview of monerans, protists, and animals.

102. (DN) PRINCIPLES OF BIOLOGY II (4:3:2) Continuation of BIOL 101 DN, with emphasis on plants and fungi; genetics of organisms and populations; evolution. Prerequisite: BIOL 101 DN.

*Students must take a combination of ASTRO 010 GN and 011 GN in order to obtain General Education credits in astronomy.

BIOMEDICAL EQUIPMENT TECHNOLOGY (BE T)

201. **PHYSIOLOGICAL TRANSDUCERS (5:4:2)** Study of the principles of operation and applications of devices used for the conversion of physiological events to electrical signals. Prerequisite: EE T 114.
202. **BIOMEDICAL INSTRUMENTATION AND SYSTEMS (5:4:2)** Introduction to the operating principles, maintenance, and analytic troubleshooting of electronic, fluid, and pneumatic biomedical equipment. Prerequisite: BE T 201.
203. **BIOMEDICAL EQUIPMENT LABORATORY (Internship) (4:1:6)** Practical experience, within or related to the hospital environment, on a variety of biomedical instruments. Prerequisites: BE T 204, BIOL 041 DN.
204. **MEDICAL AND CLINICAL EQUIPMENT (3:2:2)** Principles of operation of clinical, medical radiography, intensive care, anesthesia, respiratory, noninvasive imaging, and emergency equipment; hospital electrical safety. Prerequisite: BE T 201.
205. **HIGH-POWER MEDICAL EQUIPMENT (3:2:2)** A study of high-power medical instrumentation using lumped-element p-n junction devices, crystals, and lasers. Prerequisite: EE T 114.
297. **SPECIAL TOPICS (1–9)**

BLACK STUDIES (BL ST)

100. **(DS;DF) EVOLVING STATUS OF BLACKS IN THE TWENTIETH CENTURY: INTERDISCIPLINARY PERSPECTIVES (3:3:0)** An interdisciplinary team-taught exploration of the evolving status of Black Americans in the twentieth century. Emphasis on the civil rights movement.
145. **(RL ST) (DH;DF) AFRO-AMERICAN RELIGION (3:3:0)** History and significance of the religious dimension from enslavement to the civil rights movement and contemporary churches and sects.
146. **(RL ST) (DH;DF) THE LIFE AND THOUGHT OF MARTIN LUTHER KING, JR. (3:3:0)** A survey of the civil rights leader, including his religious beliefs, intellectual development, and philosophy for social change.

BUILDING ENERGY SYSTEMS TECHNOLOGY (BES T)

101. **INTRODUCTION TO BUILDING ENERGY SYSTEMS (2:1:2)** Introduction to building energy systems technology from the standpoint of history, economics, and energy.
204. **ANALYSIS OF BUILDING ENERGY SYSTEMS (3:1:5)** Comprehensive analysis and application of building energy systems; calculation and layout; computer modeling of systems. Prerequisite: fourth-semester standing.
206. **PASSIVE SYSTEMS AND CONSERVATION METHODS (3:3:0)** Passive concepts and design; earth sheltering; energy audits and conservation techniques; wood-burning equipment.
207. **LIQUID HEATING AND COOLING SYSTEMS (3:2:2)** Water, steam, and refrigerant systems and components; pumps and piping; heat exchangers; fluid and components selection; power and controls. Prerequisites: BES T 101, ME T 281.
208. **AIR HEATING, COOLING, AND VENTILATING SYSTEMS (3:2:2)** Air systems and distribution components; fans and ductwork; heat exchange coils; dampers and controls; residential fired equipment operation.
209. **NONTECHNICAL ASPECTS OF BUILDING ENERGY SYSTEMS TECHNOLOGY (3:2:2)** Economic analysis techniques; cost estimating; job scheduling; legal aspects; warranties; professionalism. Prerequisite: BES T 101.
297. **SPECIAL TOPICS (1–9)**

BUSINESS ADMINISTRATION (B A)

100. **INTRODUCTION TO BUSINESS (3:3:0)** A comprehensive view of the contemporary environment of business.
195. **COOPERATIVE PRACTICUM WITH BUSINESS OFFICES (3–6)** Cooperative practical work with business offices under the supervision of the instructor.
250. **PROBLEMS OF SMALL BUSINESS (3:3:0)** Analysis of problems of the small firm, particularly for the student who wishes to venture into business. Prerequisite: 3 credits in economics.

BUSINESS LAW (B LAW)

243. **LEGAL ENVIRONMENT OF BUSINESS (3:3:0)** Social control through law: courts, basic policies underlying individual and contractual rights in everyday society. Prerequisite: third-semester standing.

BUSINESS LOGISTICS (B LOG)

301. BUSINESS LOGISTICS MANAGEMENT (3:3:0) Management of logistics function in firm, including physical supply and distribution activities such as transportation, storage facility location, and materials handling. Prerequisite: third-semester standing.

304. TRANSPORT SYSTEMS (3:3:0) Conceptual model of a transport system; environmental relationships; modal components and managerial conditions, with special application to the United States.

305. TRAFFIC MANAGEMENT (3:3:0) Analysis of traffic function in the logistics system. Evaluation of routes, rates, and shipping document procedures. Prerequisite: B LOG 301 or 304.

CHEMISTRY (CHEM)

001. (GN) MOLECULAR SCIENCE (3:3:0) Selected concepts and topics in chemistry and related physical sciences showing their development, interrelationship, and present status. Students who have received credit for CHEM 002, 011 GN, or 012 DN may not schedule this course.

011. INTRODUCTORY CHEMISTRY (3:2:2) Selected principles and applications of chemistry. Prior study of chemistry not assumed.

012. (DN) CHEMICAL PRINCIPLES (3-4) Basic concepts and quantitative relations. Prerequisite: Satisfactory performance on placement examination—students take CHEM 012 DN for 3 credits. Unsatisfactory performance on placement examination—students take either CHEM 012 DN for 4 credits or CHEM 011 or 017 DN as directed on FTCAP profile.

013. (DN) CHEMICAL PRINCIPLES (3:3:0) Continuation of CHEM 012 DN, including introduction to the chemistry of the elements. Prerequisite: CHEM 012 DN or 017 DN. Prerequisite or concurrent: CHEM 014 DN.

014. (DN) EXPERIMENTAL CHEMISTRY (1:0:3) Introduction to quantitative experimentation in chemistry. Prerequisite or concurrent: CHEM 012 DN or 017 DN.

015. (DN) EXPERIMENTAL CHEMISTRY (1:0:3) Continuation of CHEM 014 DN, with emphasis on analytical procedures. Prerequisite: CHEM 014 DN. Prerequisite or concurrent: CHEM 013 DN.

017. (DN) INTRODUCTORY AND GENERAL CHEMISTRY (5:5:2) Introductory and general chemistry for students who are required to take additional chemistry, e.g., CHEM 013 DN, but are unprepared for CHEM 012 DN. Students may not receive credit for both CHEM 017 DN and CHEM 011 or 012 DN.

023. INTRODUCTION TO MODERN ANALYTICAL CHEMISTRY (4:2:4) Contemporary methods of chemical and instrumental analysis, including potentiometric titration, specific ion electrodes, spectrophotometry, and chromatography. Prerequisite: CHEM 015 DN.

034. ORGANIC CHEMISTRY (3:3:0) Introduction to organic chemistry, with emphasis on the properties of organic compounds of biochemical importance. Not open to those who have previously scheduled CHEM 037. Prerequisite: CHEM 011, 012 DN, or 017 DN.

035. ORGANIC CHEMISTRY (3:2:4) Introduction to organic chemistry, with emphasis on the identification of organic compounds by characteristic chemical reactions and by spectroscopy. Prerequisite: CHEM 034.

036. LABORATORY IN ORGANIC CHEMISTRY (2:0:6) Basic laboratory operations; applications of theories and principles. Prerequisite: CHEM 038. Prerequisite or concurrent: CHEM 039 or 040.

037. ORGANIC CHEMISTRY (3:3:0) Introduction to organic chemistry, with emphasis on topics of particular relevance to mineral science, materials science, and engineering. Not open to those who have previously scheduled CHEM 034. Prerequisite: CHEM 011 or 012 DN.

038. ORGANIC CHEMISTRY (4:4:0) Principles and theories; nomenclature; chemistry of the functional groups; applications of spectroscopy. Students may not receive credit for both CHEM 038 and 034. Prerequisite: CHEM 013 DN.

039. ORGANIC CHEMISTRY (3:3:0) Continuation of CHEM 038. Emphasis is placed on the role of organic reactions in biological chemistry. Students may not receive credit for both CHEM 039 and 040. Prerequisite: CHEM 038.

040. ORGANIC CHEMISTRY (2:2:0) Continuation of CHEM 038 to include especially polyfunctional organic molecules. Student may not receive credit for both CHEM 039 and 040. Prerequisite: CHEM 038.

102. ENVIRONMENTAL CHEMISTRY (3:3:0) Applications of chemistry to environmental problems, including air, water, thermal pollution; pesticides; drugs and birth control agents; food additives; etc. For nonchemistry majors; chemistry majors will not receive credit.

389. SPECIAL PROBLEMS AND RESEARCH (1–4 per semester, maximum of 12) Designed for freshman or sophomore students who are prepared to undertake special problems and research by arrangement with a faculty member.

395. CHEMISTRY TEACHER ASSISTANT TRAINING (1–2) Instruction and practice in the role of the teaching assistant in the undergraduate chemistry laboratory.

CHINESE (CHNS)

001. ELEMENTARY CHINESE I (4:3:2) Introductory study of Chinese language, with audio-lingual practice of Mandarin Chinese and attention to structure and the writing system.
002. ELEMENTARY CHINESE II (4:3:2) Continued audio-lingual practice of Mandarin Chinese, further study of structure, practice in reading and writing Chinese. Prerequisite: CHNS 001.
003. INTERMEDIATE CHINESE (4:3:3) Continued audio-lingual practice of Mandarin Chinese, more extensive practice in reading and writing; study of Chinese culture. Prerequisite: CHNS 002.
004. INTERMEDIATE CHINESE (3:3:0) Readings in selected modern Chinese literature (short stories, plays, essays, and poems). Practice in simple composition. Prerequisite: CHNS 003.
110. CONVERSATION, READING, AND COMPOSITION (3:3:0) Readings in selected modern Chinese literature (short stories, plays, essays, poems) and other texts; practice in conversation and simple composition. Prerequisite: CHNS 003.
187. CHINESE FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
199. FOREIGN STUDY—BASIC CHINESE (1–8) Small-group instruction in spoken and written Mandarin at the introductory level.
296. INDEPENDENT STUDIES (1–18)
297. SPECIAL TOPICS (1–9)
299. (DF) FOREIGN STUDY—INTERMEDIATE CHINESE (3–12) Small-group instruction in spoken and written Mandarin at the intermediate level. Prerequisite: CHNS 002.

CIVIL ENGINEERING TECHNOLOGY (CE T)

109. TOPOGRAPHIC DRAWING (2:0:4) Conventional mapping symbols; constructing topographic maps from stadia notes; estimating grading quantities from topographic maps. Prerequisite: EG T 101, 102, or E G 010. Prerequisite or concurrent: CE T 111 or W F S 106.
111. PLANE SURVEYING (3:2:3) Theory of plane surveying; use, care, and adjustments of surveying equipment; traversing, areas, leveling, stadia, and plane table mapping. Prerequisite: MATH 087 GQ.
112. CURVES AND EARTHWORK (3:2:3) Computation and laying out of horizontal and vertical curves; calculation of cut and fill; setting slope stakes for construction. Prerequisite or concurrent: CE T 111, MATH 087 GQ.
113. PRACTICAL FIELD PROBLEMS (4:1:9) Geodetics, topography, field astronomy; route location; hydrographic surveys; land subdivision; use of electronic measuring devices. Prerequisites: CE T 112, 118.
118. ROUTE SURVEYING (2:0:4) Field and office operations connected with highway and railroad location; mass diagram as related to economical distribution of earthwork. Prerequisite: CE T 111. Concurrent: CE T 112.
210. STATISTICS AND LEAST SQUARES (3:3:0) Frequency distribution; histograms; frequency polygons; measures of central tendency; dispersion; uses of normal curve; least squares applied to surveying problems. Prerequisite: MATH 088 GQ.
214. APPLIED PHOTOGRAMMETRY (2:1:2) Interpretation and use of aerial photographs; mapping by photogrammetric methods; application of aerial and terrestrial photographic surveying to specific engineering problems. Prerequisite: CE T 118.
215. GEODETIC SURVEYING (3:1:4) Precision vertical and horizontal control surveys; level nets; reciprocal leveling; triangulation; state plane coordinates; astronomic observations for azimuth and latitude. Prerequisites: CE T 111, MATH 087 GQ.
216. SPECIAL SURVEYS (3:1:4) Applications of surveying in hydrography, mining, construction, and subdivision planning; surveying registration law and professional ethics. Prerequisites: CE T 112, 113.
217. CARTOGRAPHIC TECHNIQUES (2:0:4) Use of tools and equipment; projections used in art, advertising, navigation, government maps; relief methods; scribing techniques; map reproduction methods. Prerequisite: CE T 109.
261. FLUID FLOW (3:3:0) Elementary theory of fluid flow: hydrostatics; flow through orifices, Venturi meters, and pipes; flow in open channels; theory of the centrifugal pump. Prerequisites: MATH 087 GQ, MCH T 111.
290. LEGAL ASPECTS OF SURVEYING (3:3:0) Legal principles affecting the determination of property boundaries; responsibilities of surveyors, attorneys, title companies, and the court. Prerequisite: CE T 111.
297. SPECIAL TOPICS (1–9)

COMMUNICATIONS (COMM)

100. (GS) THE MASS MEDIA AND SOCIETY (3:3:0) Mass communications in the United States; organization, role, content, and effects of newspapers, magazines, television, radio, books, and films. May not be used to fulfill requirements of any major in the School of Communications.
150. (GA) THE ART OF THE CINEMA (3:1:3) The development of cinema to its present state; principles of evaluation and appreciation; examples from the past and present.
205. (WMNST) (DF) WOMEN, MINORITIES, AND THE MEDIA (3:3:0) Analysis of historical, economic, legal, political, and social implications of the relationship among women, minorities, and the mass media.
- 260W. NEWS WRITING AND REPORTING (3:1:4) News and news values; legal and ethical problems of reporting; writing and reporting news for the mass media. Prerequisites: ENGL 015 GWS or 030 GWS; third-semester standing; and typing proficiency.

COMPARATIVE LITERATURE (C LIT)

001. (GH;DE) MASTERPIECES OF WESTERN LITERATURE THROUGH THE RENAISSANCE (3:3:0) Universal themes and cultural values in works by such writers as Homer, Sappho, Chaucer, Dante, Christine de Pizan, Marguerite de Navarre, and Cervantes.
002. (GH;DE) MASTERPIECES OF WESTERN LITERATURE SINCE THE RENAISSANCE (3:3:0) Universal themes and cultural values in works by such writers as Voltaire, Goethe, Ibsen, Flaubert, Dostoevsky, Dickinson, Mann, Borges, Duras, and Rich.
003. (DH;DF) MASTERPIECES OF LITERATURE FROM AFRICA (3:3:0) From traditional oral forms to contemporary experimental blends of African and Western literary styles. Readings in English.
004. (DH) MASTERPIECES OF LITERATURE FROM THE ORIENT (3:3:0) Major writings from China, Japan, and other East Asian countries, studied in translation and viewed as world literature.
005. LITERATURES OF THE NEW WORLD (3:3:0) The growth of literature in Brazil, Spanish America, the Caribbean, the United States, and Canada. Readings in English translation.
010. (GH) THE FORMS OF WORLD LITERATURE: A GLOBAL PERSPECTIVE (3:3:0) The development of literature around the world—from epic, legend, lyric, etc., in the oral tradition, to modern written forms.
011. (DH) HEROISM IN WORLD LITERATURE (3:3:0) Cultural values and personal heroism in literary masterworks from a variety of countries and eras.
100. (DH) INTRODUCTION TO COMPARATIVE LITERATURE (3:3:0) Readings from various literatures, organized by themes (utopias, love, the monomyth or heroic quest, etc.) to introduce comparative literary study.
105. (DH) THE DEVELOPMENT OF LITERARY HUMOR (3:3:0) Literary humor expressed as satire, comedy, and farce—from ancient times to the present.
106. (DH;DE) THE ARTHURIAN LEGEND (3:3:0) The legend of King Arthur from medieval Europe to modern Japan; the diverse ideals it has represented in different contexts.
107. (DH;DE) THE LITERATURE OF EXPLORATION: INCREDIBLE VOYAGES FROM ANTIQUITY INTO THE FUTURE (3:3:0) Wanderings amid wonder, from Homer and Lucian and medieval travel legends to Renaissance exploration journals and modern interstellar imaginings.
108. (DH;DF) MYTHS AND MYTHOLOGIES (3:3:0) The myths of non-Western cultures based on selected mythologies from around the world.
111. (DH) LITERATURES OF MODERN INDIA (3:3:0) Sources, achievements, and principal themes of modern Indian poetry and prose; readings in translated or English works of representative authors.
120. THE LITERATURE OF THE OCCULT (3:3:0) Reading and discussion of important literary works dealing with witchcraft, demonology, vampirism, ghosts, from Biblical times to present; films, slides.
141. (DH) RELIGION AND LITERATURE (3:3:0) Major religious themes as expressed in literary masterpieces; sacred texts from various cultures read as literature.
184. (ENGL) (DH) THE SHORT STORY (3:3:0) Lectures, discussions, readings in translation, with emphasis on major writers of the nineteenth and twentieth centuries.
185. (ENGL) (DH) THE MODERN NOVEL IN WORLD LITERATURE (3:3:0) Development of the modern novel in the last century (outside the British Isles and the United States); lectures, discussions, readings in translation.
187. COMPARATIVE LITERATURE FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
189. (ENGL) (DH) THE FOUNDERS OF MODERN DRAMA (3:3:0) Playwrights who set the world's stage for twentieth-century drama: Ibsen, Shaw, Chekhov, and Strindberg.

COMPUTER ENGINEERING TECHNOLOGY (CMPET)

240. MICROPROCESSOR INTERFACING (5:4:2) Examination of the devices used in microprocessor systems to communicate with external digital and analog systems. Prerequisite: EE T 210, EE T 211.
241. ADVANCED MICROPROCESSOR SYSTEMS (4:3:2) Development of an understanding of microprocessor principles and systems through a study of current 8- and 16-bit microprocessors. Prerequisite: EE T 211.
242. MICROPROCESSOR SYSTEMS DESIGN AND ANALYSIS (3:1:4) Experience in designing, constructing, and testing a complete microcomputer system and its practical application to control. Prerequisite: EE T 211.
297. SPECIAL TOPICS (1–9)

COMPUTER SCIENCE (CMPSC)

001. BASIC COMPUTER PROGRAMMING (1:0:2) Fundamental characteristics of digital computers; organization and coding of problems for solution on digital computer. Prerequisite: 2 entrance units in mathematics.
100. COMPUTER FUNDAMENTALS AND APPLICATIONS (3:3:0) Introduction to computer fundamentals and applications to data processing environments. Prerequisite: 2 entrance units in mathematics.
101. (GQ) INTRODUCTION TO ALGORITHMIC PROCESSES (3:3:0) Properties of algorithms, languages, and notations for describing algorithms; applications of a procedure-oriented language to problem solving. A student will receive credit for only one of the following courses: CMPSC 101 GQ, 103 GQ, 201 GQ, 203 GQ. Prerequisite: 2 entrance units in mathematics.
102. COMPUTER ORGANIZATION AND PROGRAMMING (3:3:0) Computer components and organization, representation of numbers and characters, instruction codes, machine language, programming, assembly systems, input–output, subroutines, and macros. Prerequisite: CMPSC 101 GQ.
103. (GQ) INTRODUCTION TO PROGRAMMING TECHNIQUES (4:3:2) Design and implementation of algorithms. Structured programming. Problem-solving techniques. Introduction to a high-level, block-structured language, including arrays, procedures, parameters, and recursion. A student may receive credit for only one of the following courses: CMPSC 101 GQ, 103 GQ, 201 GQ, 203 GQ. Prerequisite: 2 entrance units in mathematics.
120. INTERMEDIATE PROGRAMMING (4:3:2) Systematic programming: top-down program development, documentation, and testing. Introduction to data structures, text processing, numerical methods, algorithm analysis, program verification. Prerequisites: CMPSC 103 GQ or 201 GQ; MATH 140 GQ.
140. INTRODUCTION TO DATA PROCESSING (3:3:0) Applications of digital computers to problems in data processing with examples from accounting, record updating, inventory control, and report generation. Prerequisite: CMPSC 101 GQ.
142. PROGRAMMING SYSTEMS FOR SMALL BUSINESS (3:3:0) Business applications programming and systems design applicable to the small business environment. Prerequisite: CMPSC 140 GQ.
144. DATA ORGANIZATION AND ACCESSING TECHNIQUES (4:3:2) Design characteristics of external storage devices; record organizations; accessing considerations for sequential, direct, relative, and indexed files; internal data structures. Prerequisites: CMPSC 102, 140.
154. ADVANCED ASSEMBLER, I/O TECHNIQUES, AND JOB CONTROL LANGUAGES (3:3:1) Macro-expansion; assembler-level I/O control; COBOL-assembler linkage conventions; advanced debugging techniques; assembler design; op-system features and JCL techniques. Students may not take both CMPSC 154 and 442 for credit. Prerequisite: CMPSC 144.
164. CONTEMPORARY TRENDS IN COMPUTER PROGRAMMING (3:3:0) State of the technology in design, code, test, and documentation techniques for information-processing systems and large EDP production programs. Students may not take both CMPSC 164 and 444 for credit. Prerequisite: CMPSC 154.
174. ANALYSIS AND DESIGN OF INFORMATION SYSTEMS (2:1:2) The organization, flow charting, programming, debugging, and documentation of a major applied problem in a field of computer application. Prerequisite: third-semester standing.
175. IMPLEMENTATION OF INFORMATION SYSTEMS (1:0:2) Implementation and evaluation of an information system as designed in CMPSC 174 with peer review of the design. Prerequisite: CMPSC 174.
201. (GQ) COMPUTER PROGRAMMING FOR ENGINEERS (3:3:0) Development and implementation of algorithms in a procedure-oriented language, with emphasis on numerical methods for engineering problems. A student may receive credit for only one of the following: CMPSC 101 GQ, 103 GQ, 201 GQ, 203 GQ. Prerequisite or concurrent: MATH 141 GQ.
203. (GQ) PRINCIPLES OF PROGRAMMING WITH BUSINESS APPLICATIONS (3:2:2) Programming in a high-level language; introduction to computers; packaged software: statistical packages and spread-sheets; designed for business students. A student may receive credit for only one of the following: CMPSC 101 GQ, 103 GQ, 201 GQ, 203 GQ. Prerequisite: 2 entrance units in mathematics.
211. INTRODUCTION TO SYSTEMS PROGRAMMING (3:2:2) Review of computer architecture concepts; assembly language programming, I/O routines, linkage and loading; microprocessor and large computer assembly languages. Prerequisite: CMPSC 120.

CURRICULUM AND INSTRUCTION (C I)

295. INTRODUCTORY FIELD EXPERIENCE FOR TEACHER PREPARATION (2–3 per semester, maximum of 6) Selected observation of schooling situations with small-group and tutorial participation. Prerequisite: second-semester standing. Concurrent: EDTHP 115 and/or EDPSY 014.

DIETETIC FOOD SYSTEMS MANAGEMENT (D S M)

100. THE PROFESSION OF DIETETICS (1:1:0) Introduction to the profession and exploration of the roles and responsibilities of dietetic professionals.

101. SANITATION PRACTICES IN FOOD SERVICE OPERATIONS (3:3:0) Practical applications related to the management of the sanitation subsystem within a food service operation. This course will not meet the prescribed requirements for the HR&IM major in any option.

103. FOOD SERVICE MANAGEMENT: THEORY AND PRACTICE (3:3:0) Professional functions of the food service system, relationships with the nutrition component of food service systems.

195. FIELD EXPERIENCE IN COMMUNITY DIETETICS (2:1:2) Planning, preparation, and field experiences in community dietetic programs. Prerequisites: D S M 103, NUTR 151.

205. HUMAN RESOURCE MANAGEMENT IN FOOD SERVICE OPERATIONS (3:3:0) Theories and principles of supervision and training of food service employees for overall operational effectiveness.

250. QUANTITY FOOD PRODUCTION MANAGEMENT (4:3:1) Systems approach to managing quantity food production functions in health care settings; included are quantity food production principles and standards.

260. MANAGEMENT OF FOOD SERVICE OPERATING SYSTEMS (4:3:1) Major principles related to managing the purchasing, food, and labor subsystems of a health care food service system. Prerequisite: D S M 250.

270. QUALITY ASSURANCE FOR DIETETIC MANAGEMENT (3:2:2) Theories, principles, and methods of managing quality dietetic services. Prerequisites: D S M 103, NUTR 252.

295. PROFESSIONAL STAFF FIELD EXPERIENCE (4:3:1) Methods of, and practice in, the client-oriented dietetic systems in health care facilities. Prerequisites: D S M 260, 304.

304. MARKETING OF FOOD SERVICES IN HEALTH CARE FACILITIES (3:3:0) Theories and applications of marketing principles to the design of consumer-oriented dietetic services.

EARTH SCIENCE (EARTH)

001. EARTH SCIENCE (3:3:0) Integrated approach to fundamental problems in the earth sciences. Fields of study include geological sciences, physical geography, and meteorology. No credit will be given for this course if a student takes GEOG 019, GEOSC 020 GN, or METEO 002.

002. (GN) GAIA—THE EARTH SYSTEM (3:3:0) An interdisciplinary introduction to the processes, interactions, and evolution of the Earth's biosphere, geosphere, and hydrosphere.

ECONOMICS (ECON)

002. (GS) INTRODUCTORY MICROECONOMIC ANALYSIS AND POLICY (3:3:0) Methods of economic analysis and their use; economic aggregates; price determination; theory of the firm; distribution.

004. (GS) INTRODUCTORY MACROECONOMIC ANALYSIS AND POLICY (3:3:0) National income measurement; aggregate economic models; money and income; policy problems.

014. (GS) PRINCIPLES OF ECONOMICS (3:3:0) Analysis of the American economy, emphasizing the nature and interrelationships of such groups as consumers, business, governments, labor, and financial institutions. Students who have passed ECON 002 GS or 004 GS or are registered in The Smeal College of Business Administration may not schedule this course.

302. (DS) INTERMEDIATE MICROECONOMIC ANALYSIS (3:3:0) Allocation of resources and distribution of income within various market structures, with emphasis on analytical tools. Prerequisite: ECON 002 GS.

304. (DS) INTERMEDIATE MACROECONOMIC ANALYSIS (3:3:0) Analysis of forces that determine the level of aggregate economic activity. Prerequisite: ECON 004 GS.

315. (DS) LABOR ECONOMICS (3:3:0) Economic analysis of employment, earnings, and the labor market; labor relations; related government policies. Prerequisite: ECON 002 GS.

323. (DS) PUBLIC FINANCE (3:3:0) Contemporary fiscal institutions in the United States; public expenditures; public revenues; incidence of major tax types; intergovernmental fiscal relations; public credit. Prerequisite: ECON 002 GS.

333. (DS) INTERNATIONAL ECONOMICS (3:3:0) Why nations trade, barriers to trade, balance of payments, adjustment and exchange rate determination, Eurocurrency markets, and trade-related institutions. Prerequisite: ECON 002 GS, 004 GS, or 014 GS.

342. (DS) INDUSTRIAL ORGANIZATION (3:3:0) Industrial concentration, size and efficiency of business firms, market structure and performance, competitive behavior, public policy and antitrust issues. Prerequisite: ECON 002 GS.

370. (DS) COMPARATIVE ECONOMIC SYSTEMS (3:3:0) Capitalism, socialism, communism, and fascism; examination of resource allocation, consumption, pricing, production, investment, income distribution, central planning. Prerequisites: ECON 002 GS or 014 GS; 3 additional credits in social science.

372. (DS) SOVIET AND OTHER CENTRALLY PLANNED ECONOMIES (3:3:0) Comparative analysis of resource allocation principles, planning methodologies, investment, industry, agriculture, domestic and foreign trade in centrally planned economies. Prerequisites: ECON 002 GS or 014 GS; 3 credits in related social science.

EDUCATIONAL PSYCHOLOGY (EDPSY)

014. LEARNING AND INSTRUCTION (3:3:0) Psychology of human learning applied toward the achievement of educational goals; evaluation of learning outcomes.

101. (GQ) ANALYSIS AND INTERPRETATION OF STATISTICAL DATA IN EDUCATION (3:3:0) An introduction to quantitative methods in educational research emphasizing the interpretation of frequently encountered statistical procedures.

297. SPECIAL TOPICS (1-9)

EDUCATIONAL THEORY AND POLICY (EDTHP)

115. EDUCATION IN AMERICAN SOCIETY (3:3:0) Introduction to the development of educational institutions, with emphasis on historical, philosophical, and sociological forces.

ELECTRICAL ENGINEERING TECHNOLOGY (EE T)

100. APPLIED ELECTRICITY (3:2:2) AC and DC circuits; machinery; controls; and introduction to electronic devices, circuits, and instrumentation. Prerequisites: MATH 087 GQ, PHYS 151.

101. FUNDAMENTALS OF ELECTRICAL CIRCUITS (3:3:0) Fundamental theory of resistance, current, voltage. Direct-current concepts from simple series circuits through Thevenin's Theorem. Prerequisite or concurrent: MATH 087 GQ.

109. ELECTRICAL CIRCUITS LABORATORY (1:0:2) Introduction to electrical apparatus, including instruments, their interconnection into basic circuits, observation of circuit behavior, and report writing. Concurrent: EE T 101.

114. ELECTRICAL CIRCUITS (3:3:0) Direct-current circuit analysis; introduction to basic magnetism and magnetic circuits; single-phase circuit fundamentals. Prerequisites: EE T 101, MATH 087 GQ.

117. DIGITAL ELECTRONICS (3:3:0) Fundamentals of digital circuits, including logic circuits, boolean algebra, Karnaugh maps, counters, and registers. Prerequisite: EE T 101.

118. ELECTRICAL CIRCUITS LABORATORY (1:0:2) Laboratory study of direct-current networks and alternating-current circuits. Prerequisite: EE T 109. Concurrent: EE T 114.

120. DIGITAL ELECTRONICS LABORATORY (1:0:2) Laboratory study of solid state pulse, digital, industrial, and motor control circuits. Prerequisite: EE T 205. Concurrent: EE T 117.

204. AC CIRCUITS (2:2:0) Application of network theorems, laws, and methods to alternating-current circuits; balanced and unbalanced polyphase systems. Prerequisite: EE T 114.

205. SEMICONDUCTOR LABORATORY (1:0:2) Laboratory study of semiconductors. Assembly and tracing of electronic circuits. Concurrent: EE T 210.

206. AC CIRCUITRY LABORATORY (1:0:2) Laboratory study of alternating-current circuits; assembly and tracing of electrical circuits. Concurrent: EE T 204.

210. FUNDAMENTALS OF SEMICONDUCTORS (3:3:0) Semiconductor physics and circuit theory including hybrid parameters; equivalent circuits; power amplifiers and frequency response of small signal amplifiers. Prerequisite or concurrent: EE T 114, MATH 088 GQ.

211. MICROPROCESSORS (4:3:2) A study of machine language programming, architecture, and interfacing for microprocessor-based systems emphasizing engineering applications and microcomputers. Prerequisite: EE T 117.

213. FUNDAMENTALS OF ELECTRICAL MACHINES (3:2:2) Direct-current machinery principles and applications; introduction to machines and basic concepts of laboratory methods related to machinery studies. Prerequisites: EE T 114, 118.

215. AC MACHINERY AND CONTROL (3:3:0) Alternating-current machinery principles and applications; survey of alternating- and direct-current machinery control methods. Prerequisites: EE T 204, 213.

ENGINEERING

216. LINEAR ELECTRONIC CIRCUITS (3:3:0) Theoretical study of linear electronic devices and circuits, including field effect transistors, integrated circuits, and operational amplifiers. Prerequisite: EE T 210.
219. AC MACHINERY LABORATORY (1:0:2) Alternators, induction generators, single- and polyphase motors, synchro units, transformers, saturable reactors, and protective devices. Prerequisite: EE T 206. Concurrent: EE T 215.
221. LINEAR ELECTRONICS LABORATORY (1:0:2) Laboratory study of transistors; study of differential and operational amplifiers. Emphasis is placed on circuit design. Prerequisite: EE T 205. Concurrent: EE T 216.
297. SPECIAL TOPICS (1-9)

ENGINEERING (ENGR)

002. ENGINEERING ORIENTATION (1:0:2) Introduction to efficient methods for analyzing and solving engineering problems.
005. EXPERIMENTAL METHODS FOR ENGINEERS (1:0:2) Introduction to experimental methods used in engineering. Applications of basic experimental and computational concepts through student involvement in laboratory experiments.

ENGINEERING GRAPHICS (E G)

003. ARCHITECTURAL GRAPHICS (2:0:6) Principles of architectural drawing; spatial relationships of points, lines, planes, and solids, with architectural applications; shadows, perspective.
010. INTRODUCTORY ENGINEERING GRAPHICS (1:0:3) Multiview projections, pictorial drawings, dimensioning, engineering standards, and working drawings.
011. ENGINEERING DESIGN GRAPHICS (1:0:3) Introduction to creative design, space analysis, graphs, graphical mathematics, vector analysis, and design implementation. Prerequisite: E G 010 or 021.
050. ENGINEERING METHODS AND GRAPHICAL COMMUNICATION (3:1:5) Introduction to engineering through graphics (multiviews, pictorials, dimensioning, space analysis); microcomputer literacy in BASIC, with computer graphics and instrumentation laboratory.

ENGINEERING GRAPHICS TECHNOLOGY (EG T)

101. TECHNICAL DRAWING FUNDAMENTALS (1:0:2) Technical skills and drafting room practices; fundamentals of theoretical graphics; orthographic projection including sectional and auxiliary views; dimensioning.
102. INTRODUCTION TO COMPUTER-AIDED DRAFTING (1:0:2) A first course presenting an intensive study utilizing a computer-assisted drafting and design system to obtain graphic solutions.
103. SPATIAL ANALYSIS (2:1:2) Spatial relations of points, lines, and solids with applications in engineering technology. Prerequisite: EG T 101.
104. COMPUTER-AIDED DRAFTING (1:0:2) A second course on the more advanced functionality of computer-aided drafting and design systems. Prerequisite: EG T 102.
201. ADVANCED COMPUTER-AIDED DRAFTING (2:1:2) Application of principles of engineering graphics; preparation of working drawings; details, examples, and bill of material using CAD. Prerequisite: EG T 101, 102, or 104.
297. SPECIAL TOPICS (1-9)

ENGLISH (ENGL)

001. (GH;DE) UNDERSTANDING LITERATURE (3:3:0) Explores how major fiction, drama, and poetry, past and present, primarily English and American, clarify enduring human values and issues.
002. (GH) THE GREAT TRADITIONS IN ENGLISH LITERATURE (3:3:0) Major works of fiction, drama, and poetry from the Middle Ages to the twentieth century expressing enduring issues and values.
003. (GH;DE) THE GREAT TRADITIONS IN AMERICAN LITERATURE (3:3:0) Major works of fiction, drama, and poetry from the colonial to the modern periods expressing enduring issues and values.
004. BASIC WRITING SKILLS (3:3:0 per semester, maximum of 6) Intensive practice in writing sentences and paragraphs, and instruction in grammar, usage, and punctuation. Designed for students with deficient preparation. *This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program.*
005. WRITING TUTORIAL (1:0:2) Tutorial instruction in composition and rhetoric for students currently enrolled in ENGL 004 or 015 (GWS;DEX). *This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program.*

015. (GWS;DEX) RHETORIC AND COMPOSITION (3:3:0) Instruction and practice in writing expository prose that shows sensitivity to audience and purpose. Prerequisite: ENGL 004 or satisfactory performance on the English proficiency examination.
030. (GWS;DEX) HONORS FRESHMAN COMPOSITION (3:3:0) Writing practice for especially qualified and screened students. Students who have passed a special writing test will qualify for this course.
050. (DA) INTRODUCTION TO CREATIVE WRITING (3:3:0) Practice and criticism in the reading, analysis, and composition of fiction, nonfiction, and poetry writing.
104. (DH) THE BIBLE AS LITERATURE (3:3:0) Study of the English Bible as a literary and cultural document.
129. (DH) SHAKESPEARE (3:3:0) A selection of the major plays studied to determine the sources of their permanent appeal. Intended for nonmajors.
133. (DH) MODERN AMERICAN LITERATURE TO WORLD WAR II (3:3:0) Cather, Eliot, Frost, Faulkner, Fitzgerald, Hemingway, Hurston, Wharton, Wright, and other writers representative of the years between the world wars.
134. (DH) AMERICAN COMEDY (3:3:0) Studies in American comedy and satire, including such writers as Mark Twain, Faulkner, Vonnegut, Ellison, O'Connor, Welty, and Heller.
139. (DH;DF) BLACK AMERICAN LITERATURE (3:3:0) Fiction, poetry, and drama, including such writers as Baldwin, Douglass, Ellison, Morrison, and Wright.
140. (DH) CONTEMPORARY LITERATURE (3:3:0) Writers such as Baldwin, Beckett, Bellow, Ellison, Gordimer, Lessing, Lowell, Mailer, Naipaul, Pinter, Plath, Pynchon, Rushdie, and Walker.
184. (C LIT) (DH) THE SHORT STORY (3:3:0) Lectures, discussions, readings in translation, with primary emphasis on major writers of the nineteenth and twentieth centuries.
185. (C LIT) (DH) THE MODERN NOVEL IN WORLD LITERATURE (3:3:0) Development of the modern novel in the last century (outside the British Isles and the United States); lectures, discussions, readings in translation.
189. (C LIT) (DH) THE FOUNDERS OF MODERN DRAMA (3:3:0) Playwrights who set the world's stage for twentieth-century drama: Ibsen, Shaw, Chekhov, and Strindberg.
191. SCIENCE FICTION (3:3:0) Science fiction as the literature of technological innovation and social change—its development, themes, and problems.
192. THE LITERATURE OF FANTASY (3:3:0) Major realms of fantasy in English and American literature; daydream and nightmare, the pastoral, dystopia, utopia, apocalypse, and the heroic.
194. (WMNST) (DH;DF) WOMEN WRITERS (3:3:0) Short stories, novels, poetry, drama, and essays by English, American, and other English-speaking women writers.
196. (AM ST) INTRODUCTION TO AMERICAN FOLKLORE (3:3:0) A basic introduction to verbal and non-verbal folklore, stressing the basic procedures of collection, classification, and analysis.
197. (AM ST) AMERICAN FOLK SONG IN ENGLISH (3:3:0) British songs in America; native repertoires, White and Black; folk ballad; and musical development.
- 202A. (GWS) EFFECTIVE WRITING: WRITING IN THE SOCIAL SCIENCES (3:3:0) Instruction in writing persuasive arguments about significant issues in the social sciences. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 GWS;DEX or 030 GWS;DEX; fourth-semester standing.
- 202B. (GWS) EFFECTIVE WRITING: WRITING IN THE HUMANITIES (3:3:0) Instruction in writing persuasive arguments about significant issues in the humanities. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 GWS;DEX or 030 GWS;DEX; fourth-semester standing.
- 202C. (GWS) EFFECTIVE WRITING: TECHNICAL WRITING (3:3:0) Writing for students in scientific and technical disciplines. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 GWS;DEX or 030 GWS;DEX; fourth-semester standing.
- 202D. (GWS) EFFECTIVE WRITING: BUSINESS WRITING (3:3:0) Writing reports and other common forms of business communication. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 GWS;DEX or 030 GWS;DEX; fourth-semester standing.
297. SPECIAL TOPICS (1–9)

ENTOMOLOGY (ENT)

012. BIOLOGY AND MANAGEMENT OF PLANT PESTS (3:2:2) Basic and practical information on the identification, habits, and control of important insect pests of plants and plant products.

EXERCISE AND SPORT ACTIVITIES (ESACT)

Exercise and sport activities courses with the suffix GPE satisfy the physical education portion of the Health Sciences and Physical Education General Education program requirements. For a current list of ESACT courses, see the Penn State *Baccalaureate Degree Programs Bulletin*.

FINANCE (FIN)

100. INTRODUCTION TO FINANCE (3:3:0) The nature, scope, and interdependence of the institutional and individual participants in the financial system. A student may not receive credit toward graduation for both FIN 100 and FIN 301. Prerequisite: third-semester standing.

108. PERSONAL FINANCE (3:3:0) Personal management of budgets, bank accounts, loans, credit buying, insurance, real estate, and security buying. May not be scheduled by Smeal College of Business Administration students. Prerequisite: third-semester standing.

297. SPECIAL TOPICS (1-9)

301. CORPORATION FINANCE (3:3:0) The acquisition and management of corporate capital; analysis of operations, forecasting capital requirements, raising capital, and planning profits. Prerequisites: ACCTG 200; ECON 002 GS, 004 GS; MATH 110 GQ; Q B A 201.

FOOD SCIENCE (FD SC)

105. (S T S) (GHS) FOOD FACTS AND FADS (3:3:0) Impact on society and the individual of modern food technology, food laws, additives, etc; historical, current, and futuristic aspects.

FORESTRY (FOR)

105. FOREST MENSURATION (3:2:3) Measurement of forests and forest products.

106. FOREST INVENTORIES (3:2:4) Application of land surveying and sampling techniques, including statistical analysis, for the determination of timber volume and growth.

108. FIELD STUDIES IN ECOLOGY (1) Field studies in ecological problems, challenges, and impacts related to normal forest practices in general resource management.

137. INTRODUCTION TO HARVESTING (1:0:4) Field application of harvesting techniques, including sale layout and operation of hand and power equipment.

138. INTERMEDIATE OPERATIONS (1:0:4) Field practicum in planting, pruning, and thinning of forest stands. Prerequisite: FOR 137.

140. LETTERING AND DRAFTING (2:0:4) Freehand, mechanical, transfer lettering skills and drafting room practices.

141. FOREST SURVEYING (4:2:8) Plane surveying and mapping techniques as applied to forestry practices. Prerequisite or concurrent: FOR 140, MATH 087 GQ.

220. FOREST ECOSYSTEM PROTECTION (3:3:0) Principles and concepts involved in managing the forest ecosystem in regard to fires, insects, and diseases.

221. FOREST FIRE TECHNOLOGY (1:0:3) Technological aspects of controlling and using fire in the forest environment. Prerequisite: FOR 220.

234. RECLAMATION MANAGEMENT (3:2:3) Consideration of various factors of soils, hydrology, and reclamation in the reclaiming and revegetation of disturbed sites. Prerequisite: FOR 141, 366, C E 114, or 210.

240. SILVICULTURAL PRACTICES (3:2:3) Principles and techniques of forest establishment, culture, regeneration, and harvesting. Prerequisite: FOR 203 or 250.

241. AERIAL PHOTO INTERPRETATION (4:2:6) Aerial photo interpretation techniques applied to land management inventories, mapping, road location, and procurement. Prerequisites: FOR 203; FOR 105 and 106, or FOR 366.

242. ELEMENTS OF PROJECT SUPERVISION IN FORESTRY (3:3:0) Supervisory techniques developed through an understanding of the behavioral sciences applied to field forestry personnel management.

245. MICROCOMPUTERS IN FORESTRY (2:1:2) Computer literacy; elementary programming in basic and software applications in forestry. Prerequisite: 3 credits in mathematics.

250. DENDROLOGY (3:0:6) Taxonomy, identification, ranges, and uses of important U.S. timber species and lesser vegetation of a regional nature.

814. FORESTRY LEADERSHIP PRACTICUM (1:0:3) Leadership techniques applied to standard forestry field operations. Prerequisite: FOR 242.

817. **URBAN FORESTRY (3:2:3)** The application of land treatment techniques and forestry practices to urban environments.
822. **FOREST MANAGEMENT SYSTEMS (2)** Field projects and an extended field tour dealing with silvicultural, mensurational, and regulation techniques of forest management planning. Prerequisite: FOR 240.
860. **FOREST VALUATION (1)** Gathering and analyzing cost and production data related to stumpage valuation and equipment management. Prerequisite: FOR 106.

FRENCH (FR)

001. **ELEMENTARY FRENCH I (4:4:0)** Grammar, with reading and writing of simple French; oral and aural work stressed. Students who have received high school credit for two or more years of French may not schedule this course for credit without permission of the department.
002. **ELEMENTARY FRENCH II (4:4:0)** Grammar and reading continued; oral and aural phases progressively increased. Students who have received high school credit for four years of French may not schedule this course for credit without permission of the department. Prerequisite: FR 001.
003. **INTERMEDIATE FRENCH (4:4:0)** Grammar, reading, composition, oral and aural exercises. Prerequisite: FR 002.
139. (GH;DF) **FRANCE AND THE FRENCH-SPEAKING WORLD (3:3:0)** An introduction to the culture of France and its impact on the world.
140. **FRENCH NOVEL IN ENGLISH TRANSLATION (1–6)** Readings of selected French masterpieces in translation; discussion of recurring themes in several literary periods.
142. (GH;DE) **FRENCH LITERATURE IN TRANSLATION (3:3:0)** An introduction to the literature of France and French-speaking countries.

GEOGRAPHY (GEOG)

010. (GN) **PHYSICAL GEOGRAPHY: AN INTRODUCTION (3:2:2)** Survey and synthesis of processes creating geographical patterns of natural resources, with application of basic environmental processes in resource management.
020. (GS;DE) **HUMAN GEOGRAPHY: AN INTRODUCTION (3:3:0)** Spatial perspective on human societies in a modernizing world; regional examples; use of space and environmental resources; elements of geographic planning.
100. (DS) **ECONOMIC GEOGRAPHY (3:3:0)** The location of economic activity at both macro- and micro-regional levels on the Earth's surface.
102. (DH) **THE AMERICAN SCENE (3:3:0)** How Americans converted wilderness into domesticated landscapes, and how the American scene visibly reflects national and regional cultures.
103. (DS;DF) **GEOGRAPHY OF DEVELOPING WORLD (3:3:0)** Patterns of poverty in poor countries; conventional and nonconventional explanations; focus on solutions; case studies of specific regions.
110. (DN) **CLIMATES OF THE WORLD (3:2:2)** Introduction to climatology, including principal processes of the global climatic system and their variation over space and time.
115. (DN) **LANDFORMS OF THE WORLD (3:2:2)** Distribution of the world's landform features and mineral resources; their characteristics, causes, and significance. Practicum includes correlated field trips and laboratory studies.
120. (DS) **URBAN GEOGRAPHY (3:3:0)** Urban growth and stagnation; location of cities and urban systems; intraurban spatial structure; contemporary American urban problems.
124. (DS) **ELEMENTS OF CULTURAL GEOGRAPHY (3:3:0)** Locational analysis of changes in non-Western cultures. Problems of plural societies, economic development, population growth, and settlement.
128. (DS) **GEOGRAPHY OF INTERNATIONAL AFFAIRS (3:3:0)** Contemporary international affairs in their geographical setting; geographic elements in the development of national power, political groupings, and international disputes.

GEOSCIENCES (GEOSC)

- * 001. **PHYSICAL GEOLOGY (3:2:3)** Earth processes and their effects on the materials, structure, and morphology of the Earth's crust. Practicum includes field work, study of rocks, minerals, dynamic models, and topographic maps.
- * 020. (GN) **PLANET EARTH (3:2:2)** Nontechnical presentation of Earth processes, materials, and landscape. Practicum includes field trips, study of maps, rocks, and dynamic models, introduction to geologic experimentation.

*This course includes from one to several field trips for which an additional charge will be made to cover transportation.

GERMAN

- * 021. (GN) EARTH HISTORY (3:2:2) Evolution of the Earth; changing patterns of mountains, lowlands, and seas; development of living organisms. Practicum includes field trips, studies of geologic maps, geologic problems, fossils.
040. (GN) THE SEA AROUND US (3:2:2) Introduction to marine science, including physical, chemical, biological, and geological aspects of oceanography; the sea as a multipurpose natural resource.

GERMAN (GER)

001. ELEMENTARY GERMAN I (4:3:2) Listening, speaking, reading, writing; introduction to basic structures and vocabulary through dialogues and literary and cultural readings. Students may receive credit for only one of the following: GER 001, 011, or 015. Students who have received high school credit for two or more years of German may not schedule this course for credit without permission of the department.
002. ELEMENTARY GERMAN II (4:3:2) Listening, speaking, reading, writing; introduction to basic structures and vocabulary through dialogues and literary and cultural readings. Students may receive credit for only one of the following: GER 002, 012, or 016. Students who have received high school credit for four years of German may not schedule this course for credit without permission of the department. Prerequisite: GER 001.
003. INTERMEDIATE GERMAN (4:3:2) Continued skill development; readings consisting of short literary and journalistic writings; increased attention to German cultural context. Students may receive credit for only one of the following: GER 003, 012, or 016. Prerequisite: GER 002.
011. INTENSIVE BASIC GERMAN (6:5:2) Listening, speaking, reading, writing basic structures and vocabulary of German. Taught on an accelerated basis. Students may receive credit for only one of the following: GER 001, 011, or 015.
012. INTENSIVE INTERMEDIATE GERMAN (6:5:2) Continued skill development of structures and vocabulary; listening, speaking, reading, writing. Taught on an accelerated basis. Students may receive credit for only one of the following: GER 002, 003, 012, or 016. Prerequisite: GER 011.
015. READING GERMAN I (3:3:0) Survey of German grammar, with readings in technical prose, for students whose programs permit only two semesters of foreign language. Students may receive credit for only one of the following: GER 001, 011, or 015.
016. READING GERMAN II (3:3:0) Continuation of GER 015, with readings in the student's own field. Students may receive credit for only one of the following: GER 002, 012, or 016. Prerequisite: GER 015.
100. (GH;DF) GERMAN CULTURE AND CIVILIZATION (3:3:0) Life of the German people from the early Middle Ages to modern times; their literature and arts, music, science, and philosophy. Conducted in English.
120. (DH) THE FAUST THEME IN LITERATURE AND IN OTHER ARTS (3:3:0) Survey of the Faust theme in literature (Spiess, Marlowe, Goethe, Mann), book illustrations, music (Gounod), theatre, film, and visual arts.
150. (GH) MASTERPIECES OF GERMAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Major works and prominent authors, e.g., *Niebelungenlied*, *Tristan*, Lessing, Goethe, Schiller, Heine, Hauptmann, Hesse, Mann, Kafka, Böll, Grass, Frisch.
157. (DH;DF) PENNSYLVANIA GERMANS: THE CULTURE OF THE SECTARIANS (3:3:0) Survey of the background, customs, literature, religion, folklore, folk art, music, and education of the Pennsylvania Germans. Conducted in English.
180. (DH) GOETHE AND HIS CONTEMPORARIES IN ENGLISH TRANSLATION (3:3:0) Major works of Goethe and his contemporaries, especially Schiller, in translation.
190. (DH) TWENTIETH-CENTURY GERMAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Works of such writers as Brecht, Dürrenmatt, Grass, Hesse, Kafka, Mann, Rilke, and Weiss.
195. (DH) MODERN GERMAN DRAMA AND THEATRE (3:3:0) Plays and their stage realization by writers such as Hauptmann, Schnitzler, Wedekind, Kaiser, Brecht, Dürrenmatt, Weiss, Handke, and Fassbinder.
200. (DH;DF) CONTEMPORARY GERMAN CULTURE (3:3:0) Survey of divided and unified Germany after World War II, her politics, economics, society, arts, and educational system in the international context. Conducted in English.

GREEK (GREEK)

001. ELEMENTARY CLASSICAL AND NEW TESTAMENT GREEK (4:3:2) Pronunciation, forms, syntax, and translation.
002. ELEMENTARY CLASSICAL AND NEW TESTAMENT GREEK (4:3:2) Further instruction in syntax and sentence structure. Prerequisite: GREEK 001.
003. INTERMEDIATE CLASSICAL AND NEW TESTAMENT GREEK (4:3:2) Selections from representative authors. Prerequisite: GREEK 002.

*This course includes from one to several field trips for which an additional charge will be made to cover transportation.

187. GREEK FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

297. SPECIAL TOPICS (1–9)

HEALTH EDUCATION (HL ED)

003. (GHS) DRUGS IN SPORTS (1:1:0) Nature of drug use, misuse, and abuse in the athletic setting with implications for counseling and controls.

005. (GHS) HEALTH ASPECTS OF SPORT (1:1:0) Basic principles and concepts of safety, health, and fitness for recreation and sport.

013. (GHS) STANDARD FIRST AID, PERSONAL SAFETY, AND CPR (1:1:1) Theoretical and technical aspects of standard first aid, personal safety, and cardiopulmonary resuscitation (CPR).

015. (GHS) LIFE-STYLE FOR BETTER HEALTH (1:1:0) Concepts of health, life-style, and risk factors; development and implementation of personal action plans.

019. (GHS) HEALTH AND DISEASE (1:1:0) Essentials of communicable and chronic disease control.

043. (GHS) DRUGS IN SOCIETY (1:1:0) An exploration of the health-related aspects of drug use and abuse.

044. (GHS) INTRODUCTION TO DEATH EDUCATION (1:1:0) Educational and consumer aspects of dying and death from a health education perspective.

045. (GHS) ALCOHOL AWARENESS EDUCATION (1:1:0) A course designed to raise awareness relative to the use and abuse of beverage alcohol.

046. (GHS) INTRODUCTION TO HEALTH ASPECTS OF HUMAN SEXUALITY (1:1:0) An examination of health concerns related to sexuality and sexual behavior.

048. (GHS) VALUES AND HEALTH BEHAVIOR (1:1:0) An exploration of opinions, beliefs, attitudes, and personal values as they relate to decision making and health behavior.

057. (GHS) CONSUMER HEALTH (1:1:0) Essentials for determining credibility of claims for particular health services and products from a consumer's perspective.

060. (GHS) PRINCIPLES AND PRACTICES OF HEALTHFUL LIVING (3:3:0) Facts and principles as related and applied to the science of living serve as a basis for health instruction and student guidance.

100. PHYSICAL THERAPIST ASSISTANT—INTRODUCTION (3:2:2) Orientation to the field of physical therapy, historical background of the profession, professional ethics, medical terminology, and patient transportation techniques.

150. PHYSICAL THERAPIST ASSISTANT—PROCEDURES I (2:1:2) General considerations for basic physical therapy modalities, including their indications, contraindications, skill development, and practical application.

160. THERAPEUTIC EXERCISE I (2:1:2) Introduction to the principles of exercise in the treatment of disease and injury.

250. PHYSICAL THERAPIST ASSISTANT—PROCEDURES II (3:1:4) General considerations for physical therapy modalities, including their indications, contraindications, skill development, and practical application.

260. THERAPEUTIC EXERCISE II (2:1:2) Advanced principles of exercise in the treatment of disease and injury.

270. PATHOPHYSIOLOGY (3:3:0) Introduction to medical and postoperative conditions and/or disease states most frequently treated by physical therapy modalities.

280. REHABILITATION (3:2:2) Examination of techniques and laboratory experiences in rehabilitation techniques for the physically challenged.

303. (GHS) EMERGENCY CARE (3:2:2) Competencies leading toward certification in Advanced First Aid and Emergency Care and Cardiopulmonary Resuscitation.

384. APPLIED KINESIOLOGY (3:2:2) Study of anatomical structure, body movement. Characteristic muscle action and motion will be analyzed in relation to physical therapy context. Prerequisite: BIOL 029.

395E, 395F, 395G. PHYSICAL THERAPIST ASSISTANT—PRACTICUM I, II, III (4 credits each) The practice of physical therapist assistant skills in a clinical setting under the direct supervision of a physical therapist. Prerequisites: HL ED 150, 160, 250, 260, 280.

HEALTH POLICY AND ADMINISTRATION (H P A)

101. INTRODUCTION TO HEALTH SERVICES ORGANIZATION (3:3:0) Examination of social, political, economic, historic, and scientific factors in the development and organization of the medical care health services.

301. HEALTH SERVICES POLICY ISSUES (3:3:0) Analysis of major issues in health services delivery in hospitals, medical practice, public health, mental health, and health professional education. Prerequisites: H P A 101, PL SC 001 GS, ECON 002 GS.

HEBREW

310. HEALTH CARE AND MEDICAL NEEDS (3:3:0) Health care from an individual, family, and community standpoint illustrated with specific diseases and health problems. Prerequisite: 3 credits in biology.

HEBREW (HEBR)

001. BASIC MODERN HEBREW (4:3:2) An introduction to modern Hebrew in its written and spoken forms; oral and aural work stressed.

002. BASIC MODERN HEBREW II (4:3:2) Continued study of grammar; emphasis on improving oral-aural facility, with increased attention to reading and writing. Prerequisite: HEBR 001.

003. INTERMEDIATE MODERN HEBREW (4:3:2) Grammar, reading, composition, and oral and aural exercises. Prerequisite: HEBR 002.

010. (GH;DF) JEWISH CIVILIZATION (3:3:0) Life of the Jewish people from Biblical times, emphasizing cultural, religious, and institutional developments.

187. HEBREW FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester and enrollment in the College of the Liberal Arts.

295. INTERNSHIP (1-8)

296. INDEPENDENT STUDIES (1-18)

297. SPECIAL TOPICS (1-9)

HISTORY (HIST)

001. (GH) THE WESTERN HERITAGE I (3:3:0) A survey of the Western heritage from the ancient Mediterranean world to the dawn of modern Europe.

002. (GH) THE WESTERN HERITAGE II (3:3:0) A survey of the Western heritage from the dawn of modern Europe in the seventeenth century to the present.

003. (GH) THE AMERICAN NATION: HISTORICAL PERSPECTIVES (3:3:0) Central themes in American history from discovery and settlement to the present.

010. (GH;DF) NON-WESTERN CIVILIZATIONS (3:3:0) Introduction to social, economic, and political evolution of non-Western cultures; responses to the West; modernization and development.

012. (DH) HISTORY OF PENNSYLVANIA (3:3:0) Chronological and topical survey, emphasizing immigration of diverse ethnic groups and religious, political, economic, and social developments, including industrialization and urbanization.

020. (DH;DE) AMERICAN CIVILIZATION TO 1877 (3:3:0) A historical survey of the American experience from its colonial beginnings through the Civil War and Reconstruction.

021. (DH;DE) AMERICAN CIVILIZATION SINCE 1877 (3:3:0) A historical survey of the American experience from the emergence of urban-industrial society in the late nineteenth century to the present.

100. (DH) ANCIENT GREECE (3:3:0) Greek world from the earliest Aegean cultures to the death of Alexander the Great and the beginnings of Hellenistic civilization.

101. (DH) THE ROMAN REPUBLIC AND EMPIRE (3:3:0) History of the Roman Republic and Empire from the origins of Rome to the disintegration of the Empire.

105. (DH) THE BYZANTINE EMPIRE (3:3:0) Development of Byzantine civilization from the decline of the Roman Empire to the fall of Constantinople.

107. (MEDVL) (DH) MEDIEVAL EUROPE (3:3:0) Rise and development of the civilization of medieval Europe from the decline of Rome to 1500.

108. (DH) THE CRUSADES: HOLY WAR IN THE MIDDLE AGES (3:3:0) The social and political history of medieval religious warfare in Europe and the Middle East.

116. (DS) FAMILY AND SEX ROLES IN MODERN HISTORY (3:3:0) Historical perspectives on the Western family since 1500: gender roles, marriage, sexuality, child rearing, and old age; emphasis on United States.

117. (DH) WOMEN IN MODERN HISTORY (3:3:0) Modernization and women: changing images and roles since the mid-eighteenth century in the family, workshop, politics, society; cross-cultural comparisons.

120. (DS) EUROPE SINCE 1848 (3:3:0) Political, social, and ideological developments; origin and impact of two World Wars; totalitarianism and democracy; changing role in the world.

141. (DH) MEDIEVAL AND MODERN RUSSIA (3:3:0) Introductory survey, including political, social, economic, and cultural development of Kievan, Muscovite, and Imperial Russia.

142. (DS) HISTORY OF COMMUNISM (3:3:0) Marxism; Leninism and evolution of the Soviet Union; formation and development of the communist bloc; impact of Chinese Communism.

143. (DH) HISTORY OF FASCISM AND NAZISM (3:3:0) The study of right-wing totalitarianism in the twentieth century, with special emphasis on Fascist Italy and Nazi Germany.

HOTEL, RESTAURANT, AND INSTITUTIONAL MANAGEMENT

144. **THE WORLD AT WAR: 1939–1945 (3:3:0)** In-depth study of the origins and conduct of World War II. Political and economic aspects as well as military.
150. **COLONIAL PENNSYLVANIA (3:3:0)** Development of the colony of Pennsylvania through the war for American independence, covering immigration, economics, politics, religion, and society.
151. **(DS) TECHNOLOGY AND SOCIETY IN AMERICAN HISTORY (3:3:0)** Development of technology in America from colonial times; its reception and its influence on social, economic, and political life.
152. **(DH) THE AFRO-AMERICAN EXPERIENCE (3:3:0)** African roots; colonial and revolutionary experiences; slavery and abolitionism; Civil War and reconstruction; accommodation and protest; the new militancy.
154. **HISTORY OF WELFARE IN AMERICA (3:3:0)** History of the care of dependent people (including children, the aged, mentally ill, unemployed) from colonial times to the present.
155. **(DS) AMERICAN BUSINESS HISTORY (3:3:0)** The development of business from the planting of the colonies, through the stages of industrialization, to the present.
156. **(L I R) HISTORY OF THE AMERICAN WORKER (3:3:0)** A study of the American worker from the preindustrial era to the present.
158. **HISTORY OF AMERICAN IMMIGRATION (3:3:0)** The waves of migration to America and an analysis of the resulting minority groups, their reception, assimilation, and persisting identity.
173. **(DS;DF) VIETNAM AT WAR (3:3:0)** Rise of nationalism and communism; origins of conflict; United States involvement; impact on postwar regional and international politics; contemporary Vietnam.
174. **(DH;DF) THE HISTORY OF TRADITIONAL EAST ASIA (3:3:0)** Comparative cultural, institutional, and social history of traditional China and Japan to their contact with the industrialized West.
175. **(DH;DF) THE HISTORY OF MODERN EAST ASIA (3:3:0)** Comparative survey of the internal developments and external relations of China and Japan since their contact with the industrialized West.
178. **(DH) LATIN AMERICAN HISTORY TO 1820 (3:3:0)** Conquest of the New World, development of colonial institutions, impact on native cultures, and origins of independence movements.
179. **(DH) LATIN AMERICAN HISTORY SINCE 1820 (3:3:0)** Origin, political growth, international relations, and economic status of the Latin American republics, with emphasis upon present-day conditions.
181. **(DH;DF) INTRODUCTION TO THE MIDDLE EAST (3:2:2)** Origins of Islamic civilization; expansion of Islam; the Ottoman Empire; the Middle East since 1918.
191. **(DH) EMERGING AFRICA (3:3:0)** Indigenous African societies; impact of Rome, Islam, and Europe; slave trade; colonialism; nationalism; problems since independence.

HOTEL, RESTAURANT, AND INSTITUTIONAL MANAGEMENT (HR&IM)

201. **INTRODUCTION TO MANAGEMENT IN THE HOSPITALITY INDUSTRY (2:2:0)** Exploration and analysis of management opportunities, functions, methods, and concepts in various segments of the hospitality industry. Concurrent: HR&IM 202.
202. **COLLOQUIUM IN HOSPITALITY MANAGEMENT (1–4)** Major industry and professional speakers lecture on current issues followed by discussion with students and faculty. Prerequisite or concurrent: HR&IM 201.
204. **HOTEL AND RESTAURANT MARKETING AND MERCHANDISING (3:3:0)** Merchandising and marketing as a system concerned with motivating consumers to purchase hospitality products and services. This course will not meet the prescribed requirements for the HR&IM major in any option.
250. **QUANTITY FOOD PRODUCTION ANALYSIS (4:3:2)** Physical characteristics of principal food product groups considered. Topics include purchasing problems, preparation techniques, quality and cost control. This course will not meet the prescribed requirements for the HR&IM major in any option.
260. **HOSPITALITY SUPERVISION SEMINAR (4)** Hospitality management topics are discussed with a major emphasis on operations management. This course will not meet the prescribed requirements for the HR&IM major in any option. Prerequisites: HR&IM 204, 301, 310, 380. Prerequisite or concurrent: HR&IM 250.
270. **HOSPITALITY ADMINISTRATION SEMINAR (4)** Components of food service systems are identified and studied as separate problems and as a total system. This course will not meet the prescribed requirements for the HR&IM major in any option. Prerequisite: HR&IM 260.
295. **ANALYSIS OF FIELD EXPERIENCE I (2:2:0)** Directed written and oral analysis of the 500-hour hospitality working experience focusing on the physical and social environment.
301. **INTRODUCTION TO THE MANAGEMENT OF SERVICE OPERATIONS (3:3:0)** An introduction to management principles and concepts used in service operations.
310. **FOOD AND BEVERAGE PURCHASING AND SANITATION (3:3:0)** Food and beverage purchasing and sanitation principles for hospitality operations.
320. **PROPERTY AND PHYSICAL PLANT MANAGEMENT (3:3:0)** Analysis and management of engineering and maintenance systems, including mechanical, electrical, building, environmental, and energy management. Prerequisite or concurrent: HR&IM 201.

HUMAN DEVELOPMENT

337. FOOD, BEVERAGE, AND LABOR COST CONTROL (3:3:0) Techniques for analyzing and controlling food, beverage, and labor costs in hospitality organizations. Prerequisite: ACCTG 200.
380. LODGING SYSTEMS MANAGEMENT I (3:3:0) Systems analysis, design, and application for hotel functions, including guest services, reservations, reception, telecommunications, guest-city ledger, and the night audit. Prerequisite: ACCTG 200. Prerequisite or concurrent: HR&IM 201.
381. LODGING SYSTEMS MANAGEMENT II (3:3:0) Systems analysis, design, and application for security, housekeeping, and laundry operations management, with additional emphasis on physical design. Prerequisite: HR&IM 380.

HUMAN DEVELOPMENT (H DEV)

100. INTRODUCTION TO HUMAN DEVELOPMENT (1:1:0) Human development as a process of man-environment transactions, and the relationships of various fields to the study of that process.
102. POLICY AND PLANNING FOR HUMAN DEVELOPMENT (3:3:0) Multidisciplinary analysis of concepts and practice in the creation and administration of social interventions for human development.
200. EMPIRICAL INQUIRY IN HUMAN DEVELOPMENT (3:2:2) Introduction to methods and philosophy of empirical inquiry applied to problems of human development.
395. FIELD PROJECTS (1-12) Independent study and research in a human service program; written and oral summary of rationale, procedures, findings.

HUMAN DEVELOPMENT AND FAMILY STUDIES (HD FS)

129. (GS;DE) INTRODUCTION TO HUMAN DEVELOPMENT AND FAMILY STUDIES (3:3:0) Introduction to psychosocial and family development at all stages of the individual and family life cycle.
216. PERSONAL AND INTERPERSONAL SKILLS (2:2:0) Conceptions of life-span personal and interpersonal skill enhancement.
218. FOUNDATIONS OF MARRIAGE (3:3:0) Factors influencing the husband/wife relationship across the life course.
219. FAMILY FINANCIAL MANAGEMENT (3:3:0) How families plan their finances and factors that determine their decisions.
229. (DS) INFANT AND CHILD DEVELOPMENT (3:3:0) Theory, research, and methods of social/behavioral/biological sciences related to developmental processes and interventions during infancy and childhood.
239. (DS) ADOLESCENT DEVELOPMENT (3:3:0) Social, behavioral, and biological development and intervention throughout adolescence.
249. (DS) ADULT DEVELOPMENT AND AGING (3:3:0) Physiological, psychological, and social development and intervention from young adulthood through old age.
297. SPECIAL TOPICS (1-9)
311. INDIVIDUAL AND FAMILY INTERVENTIONS (3:3:0) Survey of individual and family formal and informal intervention efforts; historical and current perspectives and approaches. Prerequisites: HD FS 129 GS;DE; 3 credits in social, behavioral, or biological sciences.
315. (DF); 315W. (DF) FAMILY DEVELOPMENT (3:3:0) Family functions over the life course: family from a multidisciplinary perspective. Prerequisites: HD FS 129 GS;DE; 3 credits in social, behavioral, or human biological sciences.
327. HUMAN DEVELOPMENT ACROSS THE LIFE SPAN (3:3:0) A review of research and theory on human development across the life span from a multidisciplinary perspective. Prerequisites: HD FS 129 GS;DE; 3 credits in social, behavioral, or human biological sciences.
330. OBSERVATION OR EXPERIENCE WITH PRESCHOOL CHILDREN (3:1:4) Directed observations of, or supervised experience with, preschool children in group or home settings. Prerequisite: HD FS 229 DS or PSY 213 DS.

HUMANITIES (HUMAN)

001. (GH) VALUES OF THE WESTERN CULTURAL HERITAGE (3:3:0) Fundamental values of human experience as expressed in outstanding philosophical and literary works.
002. (GH) SHAPING OF THE MODERN MIND (3:3:0) Relevance to the present age of influential literary and philosophical texts illustrative of the principal epochs of Western civilization.
021. (DH) IDEAS AND ARTS (3:3:0) Interaction of intellectual and aesthetic values from the Renaissance to the present.

050. (DH) THE LITERATURE AND LORE OF MINING (3:3:0) Experience and values of mining tradition: survey of the literature and lore, including field research.

088. (DH) AUSTRALIAN/NEW ZEALAND CULTURAL PERSPECTIVES (3:3:0) Australian and New Zealand cultural and social perspectives, with emphasis on the historical development of intellectual, aesthetic, and humanistic values.

101. (DH) MODERN SCIENCE AND HUMAN VALUES (3:3:0) Relationships of science to the aspirations, values, and arts of man.

102. THE GRAND TOUR: A VISUAL SURVEY OF EUROPEAN HISTORY (3:3:0) A historical interdisciplinary examination of the visual heritage of Italy, France, Germany, Spain, and the British Isles.

INDUSTRIAL ENGINEERING (I E)

315. INDUSTRIAL ORGANIZATION AND ADMINISTRATION (3:3:0) Fundamental principles of organization leading to intelligent appreciation of the simpler problems of factory organization and operation. Students registered in Industrial Engineering may not schedule this course.

INDUSTRIAL ENGINEERING TECHNOLOGY (IE T)

101. MANUFACTURING MATERIALS, PROCESSES, AND LABORATORY (3:2:3) Mechanical properties of materials; primary processing methods used in manufacturing; ferrous and nonferrous metals; dimensional verification and measurements; mechanical properties evaluation; laboratory methods; statistical interpretation of data.

105. ECONOMICS OF INDUSTRY (2:2:0) Internal economics of industrial enterprise, cost factors, and methods of comparing alternate proposals.

109. INSPECTION AND QUALITY CONTROL (3:2:2) Inspection methods and procedures and their applications to control and acceptance sampling based on statistical methods. Prerequisite: MATH 087 GQ.

212. MANUFACTURING PROCESSES (2:0:6) Technology related to metal removal, material joining, casting, nondestructive testing; heat-treating, engineering measurements, and computer applications in manufacturing. Prerequisite: IE T 101.

215. PRODUCTION DESIGN (3:1:4) Planning and design of tools required for production. Study of advanced technologies in manufacturing, including CNC, robotics, CAD, and CAM. Prerequisites: EG T 201, IE T 212.

297. SPECIAL TOPICS (1–9)

INSURANCE (INS)

102. PERSONAL INSURANCE PLANNING (3:3:0) Introduction to the principles and practices of personal insurance planning. May not be scheduled by Smeal College of Business Administration students. Prerequisite: third-semester standing.

301. RISK AND INSURANCE (3:3:0) Introduction to the principles and methods of handling business and personal risks; emphasis on insurance techniques. Prerequisite: fourth-semester standing.

INTERNATIONAL AGRICULTURE (INTAG)

100. (DS;DF) INTRODUCTION TO INTERNATIONAL AGRICULTURE (3:3:0) Survey of agriculture and food production in developing countries; socioeconomic and technical considerations.

INTERNATIONAL UNDERSTANDING (INT U)

200. (DS) INTERNATIONAL UNDERSTANDING AND WORLD AFFAIRS (3:3:0) Interdisciplinary consideration of international problems, conflict and accommodation; impact of various cultures and ideologies on world affairs and foreign policy. Credit will not be given for both this course and PL SC 014 GS. Prerequisite: third-semester standing.

ITALIAN (IT)

001. ELEMENTARY ITALIAN I (4:3:2) For beginners. Grammar, with reading and writing of simple Italian; oral and aural work stressed.

002. ELEMENTARY ITALIAN II (4:3:2) Grammar and reading continued; oral and aural phrases progressively increased; composition. Prerequisite: IT 001.

003. INTERMEDIATE ITALIAN (4:3:2) Advanced grammar; oral and written composition; reading of modern authors; Italian life and culture. Prerequisite: IT 002.

JAPANESE

130. (GH;DF) ITALIAN CULTURE AND CIVILIZATION (3:3:0) Italian life from the medieval period to the present: literature, arts, and contemporary problems; Italo-American experience. (In English.)

230. (DH) MASTERPIECES OF ITALIAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Emphasis on works and authors of international importance. Lectures, readings, and written work in English.

JAPANESE (JAPNS)

001. ELEMENTARY JAPANESE I (4:3:2) Introduction to modern Japanese; development of audio-lingual facility and ability to read and write Japanese without aid of romanization.

002. ELEMENTARY JAPANESE II (4:3:2) Continuation of elementary Japanese, with emphasis on improving audio-lingual facility and strengthening reading and writing skills in modern Japanese. Prerequisite: JAPNS 001.

003. INTERMEDIATE JAPANESE (4:3:2) Continued study of modern Japanese at the intermediate level; extensive audio-lingual practice for conversational fluency; reading/writing original scripts. Prerequisite: JAPNS 002.

110. CONVERSATION, READING, AND COMPOSITION (3:3:0) Readings in selected Japanese literature and other texts; practice in conversation and composition. Prerequisite: JAPNS 003.

187. JAPANESE FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

199. (DF) FOREIGN STUDY—BASIC JAPANESE (1–8) Small-group instruction in spoken and written modern Japanese at the introductory level.

299. (DF) FOREIGN STUDY—INTERMEDIATE JAPANESE (1–12) Small-group instruction in spoken and written Japanese at the intermediate level. Prerequisite: JAPNS 002.

296. INDEPENDENT STUDIES (1–18)

297. SPECIAL TOPICS (1–9)

LABOR AND INDUSTRIAL RELATIONS (L I R)

100. (DS) INDUSTRIAL RELATIONS (3:3:0) Introductory analysis of the employment relationship and of the interrelated interests of management, workers, unions, and the public.

101. (DS) EMPLOYMENT RELATIONSHIP: LAW AND POLICY (3:3:0) An examination of basic legal principles underlying the employment relationship and their social, political, and economic bases.

104. (DS) THE PRACTICE OF COLLECTIVE BARGAINING (3:3:0) Study of the factors involved in negotiating labor contracts, the issues, processes, bargaining relationships, and public responsibilities facing the parties.

156. (HIST) HISTORY OF THE AMERICAN WORKER (3:3:0) A study of the American worker from the preindustrial era to the present.

296. INDEPENDENT STUDIES (1–18)

LANDSCAPE ARCHITECTURE (LARCH)

* 003. (GA) THE NATURAL AND HISTORIC LANDSCAPE (3:3:0) Changing attitudes toward urban and rural outdoor spaces and their aesthetic and cultural value.

* 060. (GA) HISTORY OF LANDSCAPE ARCHITECTURE (3:3:0) A survey of the historical development of outdoor space in relationship to allied arts from early beginnings to this century.

LANGUAGE AND LITERACY EDUCATION (LL ED)

005. COLLEGE READING IMPROVEMENT I (3:3:0) Improvement of basic reading skills: vocabulary development; literal and interpretative comprehension; application of these skills more efficiently into college work. Prerequisite: limited to students whose academic profile sheets indicate help in reading is needed.

010. COLLEGE READING IMPROVEMENT II (3:3:0) Development of higher-level comprehension, vocabulary, and study skills incorporated into content area reading. Prerequisite: LL ED 005.

LATIN (LATIN)

001. ELEMENTARY LATIN (4:3:2) Pronunciation; inflections; simple rules of syntax.

002. ELEMENTARY LATIN (4:3:2) Advanced syntax and sentence structure. Prerequisite: LATIN 001.

003. INTERMEDIATE LATIN (4:3:2) Selected readings from representative authors. Prerequisite: LATIN 002.

*Students may take only one course for General Education credit from LARCH 003 GA or 060 GA.

187. LATIN FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing; enrollment in the College of the Liberal Arts.
297. SPECIAL TOPICS (1–9)

LEISURE STUDIES (LE ST)

120. LEISURE AND HUMAN BEHAVIOR (2:2:0) Introduces leisure from an integrated historical and contemporary perspective. Forces shaping leisure behavior and relationships between leisure and social institutions.
277. LEISURE FOR PERSONS WITH DISABILITIES (3:3:0) Encouragement of appreciation of human diversity and impact of differences on leisure involvement.
236. SUPERVISION AND GROUP DYNAMICS IN LEISURE SERVICES (3:2:2) Supervision as it relates to middle management in leisure service. Theories, strategies, group dynamics, and decision-making authority. Prerequisite: LE ST 105.
356. PROGRAMMING IN LEISURE SERVICES (3:3:0) Translating agency philosophy and policy into understanding of organization, management, implementation, and evaluation of programming in leisure services. Prerequisite: LE ST 236.

LIBRARY STUDIES (L ST)

110. INFORMATION ORGANIZATION AND RETRIEVAL (3:2:2) Information structure and resources related to search and problem-solving procedures to identify, organize, and locate print and nonprint materials. Prerequisite: ENGL 015 GWS;DEX or 030 GWS;DEX.

LINGUISTICS (LING)

001. (GS) THE STUDY OF LANGUAGE (3:3:0) A nontechnical introduction to the study of human language and its role in human interaction. Students who have successfully completed LING 100 may not enroll in LING 001 GS.
100. FOUNDATIONS OF LINGUISTICS (3:3:0) Systematic study of linguistic structures in a variety of the world's languages; an overview of language and its organization.
102. (DH) INTRODUCTION TO HISTORICAL LINGUISTICS (3:3:0) Language change and linguistic reconstruction; general procedures and techniques used in comparative linguistics; models of languages; linguistic borrowing and influence. Prerequisite: LING 010 or 100.
220. (PSY) (DS) INTRODUCTION TO PSYCHOLINGUISTICS (3:3:0) The learning of language; language development in the child; meaning as a problem for psychology. Prerequisite: PSY 002 GS.

MANAGEMENT (MGMT)

100. SURVEY OF MANAGEMENT (3:3:0) Introduction to organizational factors relevant to management processes, including leadership, motivation, job design, technology, organizational design and environments, systems, change. For nonbusiness students only.
150. SUPERVISORY MANAGEMENT (3:3:0) Preparation for supervisory positions in formal organizations. Emphasis placed on the motivational aspects of the supervisor's job. Prerequisite: MGMT 100.

MANAGEMENT INFORMATION SYSTEMS (M I S)

100. INTRODUCTION TO MANAGEMENT INFORMATION SYSTEMS (3:3:0) Business computer systems and their impact on management decision making. A student may not receive credit toward graduation for both M I S 100 and 301.
101. MICROCOMPUTER PROGRAMMING IN STRUCTURED BASIC (3:3:0) Introduction to the microcomputer algorithmic process using BASIC as the vehicle to construct computer solutions to common problems.
103. MICROCOMPUTER APPLICATIONS IN BUSINESS (3:3:0) Introduction to current business uses of the microcomputer, including spreadsheets, data base management, word processing, and decision-making models.
106. SPECIALIZED MICROCOMPUTER APPLICATIONS IN BUSINESS (1–6) Use of the microcomputer in the functional areas of business (e.g., accounting, management, marketing, finance, etc.). Prerequisites: 3 credits in a business administration appropriate functional area; prior written approval of department.
110. INTRODUCTION TO COBOL (3:3:0) Fundamentals of structured COBOL programming. Prerequisite: M I S 100.
111. ADVANCED COBOL (3:3:0) Advanced structured COBOL programming. Prerequisite: M I S 110.

MARKETING (MKTG)

150. PROMOTION MANAGEMENT (3:3:0) The application and management of various forms of persuasive communication with potential customers; advertising, publicity, personal selling, sales promotion. Prerequisite: MKTG 221.

160. PRINCIPLES OF RETAILING (3:3:0) Introduction to the management of retailing organizations with emphasis on decision making. Prerequisite: MKTG 221.

180. PRINCIPLES OF BUSINESS MARKETING (3:3:0) Introduction to the management of business-to-business marketing strategy. Emphasizes strategic response to industrial marketing opportunities and response to competition. Prerequisite: MKTG 221.

190. INTRODUCTION TO MARKETING RESEARCH (3:3:0) Practical aspects of marketing research, with emphasis on practical details of operating a small-scale project. Prerequisites: MKTG 221, Q B A 201.

220. PERSONAL SELLING (3:3:0) Principles underlying the sales process and practical application of these principles to selling situations. Studies role of selling in total marketing process. Prerequisite: third-semester standing.

221. CONTEMPORARY AMERICAN MARKETING (3:3:0) Social and economic aspects; movement of goods and services from producers to consumers; analysis of marketing functions, systems, and institutions. A student may not receive credit toward graduation for both MKTG 221 and 301. Prerequisite: 3 credits in economics.

MATERIALS ENGINEERING TECHNOLOGY (MAT T)

200. MATERIALS LABORATORY PRACTICE (3:1:4) Introduction to the methods used to prepare microstructures of various materials, measure elevated temperature, and perform physical property tests. Prerequisites: CHEM 012 DN, PHYS 150 DN.

201. PHYSICAL ANALYSIS OF MATERIALS (3:2:2) A study of the structures in several classes of materials, manipulation of these structures, and the behavior of these materials. Prerequisites: CHEM 014 DN, MATH 087 GQ, MAT T 200.

202. MATERIALS TESTING (3:1:4) Instruction in the methods used for the mechanical property testing of materials including test specimen design, procedures, and the statistical evaluation of data. Prerequisite: MATH 087 GQ.

203. MATERIALS PRODUCTION AND PROCESSING I (3:2:2) Analysis of important materials—production from raw sources, processing into usable forms, and their ranges of physical and mechanical properties. Prerequisites or concurrent: MAT T 200, MAT T 202.

204. MATERIALS PRODUCTION AND PROCESSING II (3:2:2) A study of materials from their production, processing, and property selection aspects with visits to several materials-related plants. Prerequisites: MAT T 200, 202.

295. FIELD PRACTICE (3:1:6) Practical experience in the materials industries through either a work assignment or completion of a cooperative project with a company.

Note: These courses are deemed to be of sufficient depth that graduates from the MAT T program may pursue studies in most baccalaureate materials-related programs.

MATERIALS SCIENCE (MATSC)

101. (GN) ENERGY AND FUELS IN SOCIETY (3:3:0) Energy utilization and technological development; energy resources; energy conversion; patterns, problems, and trends in human use of energy. For nontechnical students.

MATHEMATICS (MATH)

004. INTERMEDIATE ALGEBRA (3:3:0) Algebraic expressions; linear, absolute value equations and inequalities; lines; systems of linear equations; integral exponents; polynomials; factoring. This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program. Prerequisite: MATH 003 or satisfactory performance on the mathematics proficiency examination.

017. (GQ) FINITE MATHEMATICS (3:3:0) Introduction to logic, sets, probability. Prerequisite: 2 units of high school mathematics.

018. (GQ) ELEMENTARY LINEAR ALGEBRA (3:3:0) Matrices and vectors; transformations; systems of linear equations; convex sets and linear programming. Prerequisite: 2 units of high school mathematics.

021. (GQ) COLLEGE ALGEBRA I (3:3:0) Quadratic equations; equations in quadratic form; word problems; graphing; algebraic fractions; negative and rational exponents; radicals. Prerequisite: MATH 004 or satisfactory performance on the mathematics proficiency examination.

022. (GQ) COLLEGE ALGEBRA II AND ANALYTIC GEOMETRY (3:3:0) Relations, functions, graphs; polynomial, rational functions, graphs; word problems; nonlinear inequalities; inverse functions; exponential, logarithmic functions; conic sections; simultaneous equations. Prerequisite: MATH 021 GQ.
026. (GQ) PLANE TRIGONOMETRY (3:3:0) Trigonometric functions; solutions of triangles; trigonometric equations; identities. Prerequisites: MATH 005 GQ or satisfactory performance on the mathematics proficiency examination; 1 unit of geometry.
035. (GQ) GENERAL VIEW OF MATHEMATICS (3:3:0) Survey of mathematical thought in logic, geometry, combinatorics, and chance.
036. (GQ) INSIGHTS INTO MATHEMATICS (3:3:0) Examples of mathematical thought in number theory, topology, theory of symmetry, and chance. Prerequisite: 1 unit of algebra or MATH 004.
087. (GQ) TECHNICAL MATHEMATICS (5:5:0) Algebraic expressions, exponents, radicals, equations, graphs, systems of equations, trigonometric functions, solution of right triangles, vectors, complex numbers. Prerequisite: MATH 004 or satisfactory performance on the mathematics proficiency examination.
088. (GQ) TECHNICAL MATHEMATICS AND CALCULUS (5:5:0) Logarithm, inverse trigonometric functions, trigonometric identities, inequalities, series, limits, differentiation, higher order derivatives, implicit differentiation, applications, integration, areas, volumes, differential equations. Prerequisite: MATH 087 GQ.
110. (GQ) TECHNIQUES OF CALCULUS I (4:4:0) Functions, graphs, derivatives, integrals, techniques of differentiation and integration, exponentials, improper integrals, applications. Students may take only one course for credit from MATH 110 GQ, 140 GQ, 140A GQ, 140B GQ, and 140L GQ. Prerequisite: MATH 022 GQ or satisfactory performance on the mathematics proficiency examination.
111. (GQ) TECHNIQUES OF CALCULUS II (2:2:0) Analytic geometry, partial differentiation, maxima and minima, differential equations. Prerequisite: MATH 110 GQ.
140. (GQ) CALCULUS WITH ANALYTIC GEOMETRY I (4:4:0) Functions, limits; analytic geometry; derivatives, differentials, applications; integrals, applications. Students may take only one course for credit from MATH 110 GQ, 140 GQ, 140A GQ, 140B GQ, and 140L GQ. Prerequisites: MATH 022 GQ, 026 GQ; or MATH 040 GQ; or MATH 041 GQ; or satisfactory performance on the mathematics proficiency examination.
- 140A. (GQ) CALCULUS, ANALYTIC GEOMETRY, ALGEBRA, AND TRIGONOMETRY (6:6:0) Review of algebra and trigonometry; analytic geometry; functions; limits; derivatives, differentials, applications; integrals, applications. Students may take only one course for credit from MATH 110 GQ, 140 GQ, and 140A GQ, 140B GQ, and 140L GQ. Prerequisite: satisfactory performance on the mathematics proficiency examination.
141. (GQ) CALCULUS WITH ANALYTIC GEOMETRY II (4:4:0) Derivatives, integrals, applications; sequences and series; analytic geometry; polar coordinates; partial derivatives. Students may take only one course for credit from MATH 141 GQ, 141B GQ, and 141L GQ. Prerequisite: MATH 140 GQ, 140A GQ, 140B GQ, or 140L GQ.
200. (GQ) NUMBER SYSTEMS (3:3:0) Introduction to sets and logic, properties of the natural numbers, integers, rational and real numbers, algorithms, applications to geometry. For elementary education students only.
220. MATRICES (2:2:0) Systems of linear equations; matrix algebra; eigenvalues and eigenvectors; linear systems of differential equations. Prerequisite: MATH 110 GQ or 140 GQ.
230. CALCULUS AND VECTOR ANALYSIS (4:4:0) Three-dimensional analytic geometry; vectors in space; partial differentiation; double and triple integrals; integral vector calculus. Students who have passed either MATH 231 or 232 may not schedule MATH 230 for credit. Prerequisite: MATH 141 GQ.
231. CALCULUS OF SEVERAL VARIABLES (2:2:0) Analytic geometry in space; differential and integral calculus of several variables. Students who have passed MATH 230 may not schedule this course. Prerequisite: MATH 141 GQ.
232. INTEGRAL VECTOR CALCULUS (2:2:0) Multidimensional analytic geometry; potential fields; flux; Green's divergence and Stokes's theorem. Students who have passed MATH 230 may not schedule this course. Prerequisite: MATH 231.
250. ORDINARY DIFFERENTIAL EQUATIONS (3:3:0) First- and second-order equations; special functions; Laplace transform solutions; higher order equations. Students who have passed MATH 251 may not schedule this course for credit. Prerequisite: MATH 141 GQ.
251. ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS (4:4:0) First- and second-order equations; special functions; Laplace transform solutions; higher order equations; Fourier series; partial differential equations. Prerequisite: MATH 141 GQ.
800. BUSINESS MATHEMATICS (3:3:0) Operations with whole numbers, fractions, and mixed numbers, decimals and percent, formulas and equations, percentages and interest, introduction to algebra.

MECHANICAL ENGINEERING TECHNOLOGY (ME T)

100. MECHANISMS (2:0:4) Motion in machine elements; strength and properties of materials; design of machine elements. Prerequisite: MCH T 111.

105. KINEMATICS (3:2:3) Graphical/analytical studies of relative motions, instant centers, velocity/acceleration in plane motions, mechanisms, cams, gears, gear trains, and flexible connectors. Prerequisite: EG T 101, 102, MCH T 111.

206. MACHINE ELEMENTS AND DYNAMICS (3:2:2) Graphical and analytical study of motion in various mechanisms, including cams, gears, gear trains, and flexible connectors; introduction to kinetics. Prerequisites: EG T 101, MCH T 111. Concurrent: CMPSC 101 GQ.

207. HEAT TRANSFER (3:3:0) Basic principles of conduction, convection, and radiation, emphasizing practical applications.

210. PRODUCT DESIGN (3:2:3) Design of machine elements including levers, bearings, shafts, clutches, springs, and gears; selection of ball bearings and belts; design of small mechanical devices. Prerequisites: MCH T 213, ME T 105.

281. ELEMENTARY THERMO- AND FLUID DYNAMICS (4:4:0) Basic problems in compressible fluid flow. Laws of dynamics and thermodynamics, mechanical properties of fluids, elementary heat transfer. Prerequisite or concurrent: MATH 088 GQ, PHYS 150 DN.

282. AIR RESOURCE MANAGEMENT (2:2:0) Introduction to air pollution. Pollutants, sources, effects, air monitoring systems, air quality criteria and standards, governmental control programs and procedures.

284. SAMPLING AND MONITORING PROGRAM (2:0:4) Instrumentation and site selection, field data acquisition for major air pollutants, data analysis and evaluation.

297. SPECIAL TOPICS (1–9)

MECHANICAL TECHNOLOGY (MCH T)

111. MECHANICS FOR TECHNOLOGY: STATICS (3:3:0) Forces; moments; resultants; two- and three-dimensional equilibrium of force systems; friction; centroids and moments of inertial of areas. Prerequisite MATH 087 GQ. Prerequisite or concurrent: CMPSC 101 GQ.

212. INTRODUCTION TO DYNAMICS (3:2:2) Absolute and relative motion related to particles and simple linkages. Force-mass-acceleration, work-energy, and impulse-momentum solution techniques. Prerequisite: MCH T 111. Prerequisite or concurrent: MATH 088 GQ.

213. STRENGTH AND PROPERTIES OF MATERIALS (3:3:0) Axial stress and strain; shear; torsion; beam stresses and deflections; combined axial and bending stresses; columns, ductility, resilience, and toughness. Prerequisite: MCH T 111. Concurrent: CMPSC 101 GQ.

214. STRENGTH AND PROPERTIES OF MATERIALS LABORATORY (1:0:2) Measurement of mechanical properties of materials; structural testing, data acquisition and analysis; technical laboratory report writing. Concurrent: MCH T 213.

MEDIEVAL STUDIES (MEDVL)

107. (HIST) (DH) MEDIEVAL EUROPE (3:3:0) Rise and development of the civilization of medieval Europe from the decline of Rome to 1500.

108. (DH) MEDIEVAL CIVILIZATION (3:3:0) An interdisciplinary introduction to literature, art, and thought of the Middle Ages.

METEOROLOGY (METEO)

002. (GN) WEATHER AND SOCIETY (2:2:0) Nontechnical treatment of fundamentals of modern meteorology; effect of weather and climate on society and its activities. A student who took METEO 003 GN for more than 1 credit may not take this course.

003. (GN) INTRODUCTORY METEOROLOGY (3:2:2) Nontechnical treatment of fundamentals of modern meteorology; effect of weather and climate on man and his activities. A student who took METEO 002 GN may take the laboratory part of this course for 1 credit only.

MICROBIOLOGY (MICRB)

106. (GN) ELEMENTARY MICROBIOLOGY (3:3:0) Importance of microorganisms in public health and disease, agriculture, and industry; descriptive course for nontechnical students.

107. (GN) ELEMENTARY MICROBIOLOGY LABORATORY (1:0:3) Selected techniques with regard to recognition and enumeration of bacteria; effects of chemical and physical agents on microorganisms. Prerequisite or concurrent: MICRB 106 GN.

150. INTRODUCTORY MEDICAL LABORATORY TECHNOLOGY (4:2:10) Introduction to basic principles and procedures of clinical laboratory work. Practicum emphasizes proper collection, handling, and preparation of biological samples. Prerequisite: admission to 2-MLT program.

201. INTRODUCTORY MICROBIOLOGY (3:3:0) Elementary principles of microbial and viral interrelationships, morphology, and physiology; relation to food, water, soil, industry, and disease processes. Designed for students in technical majors.

202. INTRODUCTORY MICROBIOLOGY LABORATORY (2:0:4) Qualitative and quantitative techniques with regard to recognition of bacteria and their processes on a microscopic, colonial, and physiological basis. Prerequisite: CHEM 012 DN. Prerequisite or concurrent: MICRB 201.

MINERAL PROCESSING (MN PR)

061. INTRODUCTION TO COAL PREPARATION (3:3:0) Theory and application of modern coal preparation practice. Sampling, crushing, sizing, gravity concentration, flotation, dewatering, drying; pollution control; flow-sheets.

MINING (MNG)

023. MINERAL LAND AND MINE SURVEYING (2:0:6) Surveying theory and practice applied to mineral lands and mines; traversing, leveling, mapping, underground surveying, microcomputer drafting and graphics. Prerequisites: E G 010, 1/2 unit of secondary school trigonometry.

030. INTRODUCTION TO MINING ENGINEERING (2:2:0) Examination, development, and exploitation of mineral deposits; mining methods; unit operations; mining equipment; fundamentals of explosives.

MUSIC (MUSIC)

Note: For a complete list of music courses designated for General Education, see the Penn State *Baccalaureate Degree Programs Bulletin*.

005. (GA) AN INTRODUCTION TO WESTERN MUSIC (3:3:0) A general survey of art music in Western society, highlighting important composers and stylistic developments.

008. (GA) RUDIMENTS OF MUSIC (3:3:0) Introduction to the elements of music: notation, scales, meter, rhythm, intervals; basic chord structure. For nonmusic majors.

NUCLEAR ENGINEERING TECHNOLOGY (NE T)

201. APPLIED RADIOLOGICAL SAFETY (3:3:0) Discussion of basic radiation dose units, radiation dosimetry, biological effects of radiation, radiation monitoring techniques, government regulations, and radwaste management. Concurrent: NE T 202.

202. REACTOR TECHNOLOGY I (4:4:0) Atomic and nuclear structure, electromagnetic radiation, nuclear radiations, nuclear interactions, and fission. Prerequisite: MATH 088 GQ. Concurrent: PHYS 151.

203. APPLIED THERMODYNAMICS (3:3:0) Fundamentals based on first and second laws of thermodynamics; properties of pure substances; vapor cycles for power generation. Prerequisite: MATH 088 GQ. Concurrent: PHYS 151.

204. REACTOR TECHNOLOGY II (3:3:0) Survey of various reactor types; neutron diffusion, steady state reactor theory and applications; kinetic behavior of reactors. Prerequisite: NE T 202.

205. NUCLEAR TECHNOLOGY LABORATORY-I (2:1:2) Study of radiological safety, radiation measurements, radiation detection instrumentation, and radioactive decay. Concurrent: NE T 201, PHYS 151.

212. NUCLEAR TECHNOLOGY LABORATORY II (3:1:3) Laboratory study of radiation measurements and the diversified application of nuclear techniques and detection systems. Prerequisites: NE T 201, 205.

214. REACTOR TECHNOLOGY LABORATORY (3:1:4) Simulator study of various reactor components and safety systems; emphasis placed upon reactor operation. Prerequisites: NE T 202. Concurrent: NE T 204.

215. APPLIED HEAT TRANSFER (3:3:0) Basic principles of conduction, convection, and radiation. Emphasis placed on nuclear fuel heat removal. Prerequisite: NE T 202. Concurrent: NE T 204.

220. ELECTRICAL GENERATION ORIENTATION (1:1:0) Introduction and comparison of methods of generating electricity; description of the variety of occupations in the electrical generating industry.

221. INTRODUCTORY BOILING WATER REACTOR TECHNOLOGY (1:1:0) Introduction to the concept of commercial power generation of electricity through the use of a boiling water reactor.

NURSING

222. POWER PLANT QUALITY ASSURANCE/QUALITY CONTROL (1:1:0) Introduction to concepts of quality assurance/quality control; historical development of standards and regulatory guides; specific applications to nuclear plants.

297. SPECIAL TOPICS (1-9)

NURSING (NURS)

101. NURSING I (8:4:12) Introduction to associate degree nursing roles and nursing process; emphasis on individual health patterns and selected nursing interventions. Prerequisite or concurrent: BIOL 041 DN, 042, HD FS 129 GS.

102. NURSING II (8:4:12) Common and well-defined health problems with integrated nursing content; emphasis on infancy through young adulthood and mental health nursing. Prerequisite: NURS 101.

201. NURSING III (9:4:15) Develop expanding competencies in caring for clients with dysfunctional health patterns; emphasis on middle-age adults and perioperative nursing care. Prerequisite: NURS 102.

202. NURSING IV (10:5:15) Develop increased skills utilizing the nursing process; emphasis on care of older adults with complex dysfunctional health patterns. Prerequisite: NURS 201.

NUTRITION (NUTR)

100. (GHS) CONTEMPORARY NUTRITION CONCERNS (1:1:0) Interpretation of nutrition principles in relation to contemporary problems in selecting food for growth, development, and health. Students who have received credit for NUTR 150 or 251 GHS may not schedule this course.

150. ELEMENTARY NUTRITION (2:2:0) Fundamentals of nutrition and its relation to human health. Students who have passed NUTR 251 GHS may not schedule this course.

151. NUTRITION COMPONENT OF THE FOOD SERVICE SYSTEM (3:3:0) Introduction to basic nutrition principles and their application in a food service system. Students who have taken NUTR 150 or 251 GHS may not schedule this course.

251. (GHS) INTRODUCTORY PRINCIPLES OF NUTRITION (3:3:0) The nutrients: food sources and physiological functions as related to human growth and well-being throughout life; current nutrition issues. Students who have passed NUTR 150 may not schedule this course.

252. DIET THERAPY AND NUTRITION CARE IN DISEASE (4:3:2) Principles of nutrition care to meet therapeutic needs, inpatient care, and rehabilitation. Prerequisites: NUTR 151 or 251 GHS.

OCCUPATIONAL THERAPY (O T)

101. INTRODUCTION TO OCCUPATIONAL THERAPY (3:3:0) An introduction to the occupational therapy profession. Observation of therapists in treatment settings. Prerequisite: ENGL 015 GWS;DEX.

103. ACTIVITY ANALYSIS: DAILY LIVING SKILLS (3:2:2) Analysis of physical limitations that hinder independent performance of self-care, leisure, and work. Methods to enable performance. Prerequisite: O T 101.

105. ACTIVITY ANALYSIS: GROUP INTERACTION SKILLS (3:2:2) Group interaction observed and analyzed. Activities to facilitate and enhance interactions practiced. Prerequisite: O T 101, PSY 002 GS.

107. ACTIVITY ANALYSIS: THERAPEUTIC DEVICES (3:2:2) Therapeutic devices analyzed. Selection criteria, proper use, and precautions. Prerequisite: O T 101.

202. OCCUPATIONAL THERAPY FOR DEVELOPMENTAL DISABILITIES (2:2:0) Occupational therapy evaluation, intervention, documentation methods for developmental disabilities, observation of therapists in treatment settings. Prerequisite: HD FS 129 GS, O T 103, 105, 107.

204. OCCUPATIONAL THERAPY FOR PSYCHOSOCIAL DYSFUNCTIONS (3:3:0) Occupational therapy evaluation, intervention, documentation, methods for psychosocial dysfunctions. Observation of therapists in treatment settings. Prerequisite: HD FS 129 GS, O T 103, 105.

206. OCCUPATIONAL THERAPY FOR PHYSICAL DISABILITIES (3:3:0) Occupational therapy evaluation, intervention, documentation methods for physical disabilities, observation of therapists in treatment settings. Prerequisite: BIOL 029, BIOL 041 DN, BIOL 042, O T 103, 107.

295A. FIELD EXPERIENCE IN OCCUPATIONAL THERAPY (12) Supervised experience in select occupational therapy settings in the role of an occupational therapy assistant. Seminars included. Prerequisite: satisfactory completion of first 3 semester course requirements.

OPERATIONS MANAGEMENT (OPMGT)

150. PRODUCTION AND OPERATIONS MANAGEMENT (3:3:0) Quantitative tools and techniques used in managing the production function of a firm, including inventory control, production scheduling, capacity planning. Prerequisite: MATH 021 GQ.

PHILOSOPHY (PHIL)

- * 001. (GH) BASIC PROBLEMS OF PHILOSOPHY (3:3:0) Issues such as the foundations of knowledge, the existence of God, the problem of freedom, and the nature of reality.
- 003. (GH) MORAL VALUES (3:3:0) Freedom, choice, and obligation in conduct; values and the foundations of ethics.
- * 004. (GH) MAJOR FIGURES IN PHILOSOPHY (3:3:0) Introduction to philosophy through the study of the writings of representative thinkers in the history of philosophy.
- 010. (GH) CRITICAL THINKING AND ARGUMENT (3:3:0) Principles of correct thinking; deductive and inductive inference; use and misuse of language in reasoning.
- 012. (GQ) ELEMENTS OF SYMBOLIC LOGIC (3:3:0) Translating arguments into symbolic form and establishing validity. For nonscience majors.
- 100. (DH) THE MEANING OF HUMAN EXISTENCE (3:3:0) A study of some philosophical ways of viewing the purpose of life, the good life, and history and its meaning.
- 102. (DH) EXISTENTIALISM (3:3:0) Exploration of a controversial modern mode of philosophizing about life, death, absurdity, and faith.
- 103. (DH) ETHICS AND SOCIAL ISSUES (3:3:0) Ethical issues such as war, privacy, crime and punishment, racism and sexism, civil liberties, affirmative action, abortion, and euthanasia.
- 104. (DH) ETHICS AND THE PROFESSIONS (3:3:0) The philosophical basis for the ethics of professional practice; illustrations include law, business, public administration, journalism, engineering, teaching, medicine.
- 105. INTRODUCTION TO THE PHILOSOPHY OF LAW (3:3:0) Topics normally include concepts of law and responsibility, justice and punishment, legal ethics, and the limits of law.
- 106. BUSINESS ETHICS (3:3:0) A study of ethical issues that confront the business community. Designed primarily for majors in The Smeal College of Business Administration.
- 108. (DH) SOCIAL AND POLITICAL PHILOSOPHY (3:3:0) Philosophical analysis of political and communal order; theories of individual and group action within the structures of social obligation.
- 109. (DH) PHILOSOPHY OF ART (3:3:0) Exploration of questions about aesthetic experience, creativity, theories of beauty, principles of criticism in the arts and literature.
- 110. (DH) CONSTRUCTION OF SCIENTIFIC CONCEPTS (3:3:0) The development of scientific concepts, and the relationship of scientific thought and culture.
- 111. (DH;DF) ORIENTAL PHILOSOPHY (3:3:0) Study of philosophical, aesthetic, and religious ideas in the classics of Eastern thought.
- 124. (DH) PHILOSOPHY OF RELIGION (3:3:0) Nature and development of Western religion with interpretation of its significance in contemporary culture. Prerequisite: third-semester standing.
- 205. (DH) ANCIENT PHILOSOPHY (3:3:0) The movements of thought and major thinkers from the pre-Socratics to the neo-Platonists; emphasis on Plato and Aristotle.
- 206. (DH) MODERN PHILOSOPHY (3:3:0) Thinkers from the Renaissance to Kant; empiricism, rationalism, critical philosophy; interaction of philosophy with the revolutions in science, religion, and politics.
- 207. (DH) MEDIEVAL PHILOSOPHY (3:3:0) The movements of thought and major thinkers from the fourth to the fifteenth centuries.
- 212. (GQ) SYMBOLIC LOGIC (3:3:0) The logic of propositions, relations, and quantification; the nature and properties of formal systems. Intended primarily for science-oriented students.
- 218. (DH) CONTEMPORARY PHILOSOPHY (3:3:0) Analysis of the present climate of philosophical thought and its relation to contemporary patterns of culture.
- 221. (DH;DE) PHILOSOPHY OF SCIENCE (3:3:0) An inquiry into the form and function of concepts, laws, theories, and into the character of scientific explanation and prediction.

PHYSICAL EDUCATION

See EXERCISE AND SPORT ACTIVITIES.

*Students may take only one course for General Education credit from PHIL 001 GH or 004 GH.

PHYSICAL SCIENCE (PH SC)

007. PHYSICAL SCIENCE (3:3:0) Development of physics, including modern physical concepts and their relationship to the careers of physical scientists. May not be scheduled by students who have received credit for PHYS 100, 201 DN, 215 DN, or 221 DN.

008. PHYSICAL SCIENCE (3:3:0) Selected concepts of chemistry showing their development, interrelationship, and present status. May not be scheduled by students who have received credit for CHEM 001 DN and 002 DN.

PHYSICS (PHYS)

001. (GN) THE SCIENCE OF PHYSICS (3:3:0) Historical development and significance of major concepts and theories, with emphasis on the nature of physical science and its role in modern life. For students in nontechnical fields.

150. (DN) TECHNICAL PHYSICS (3:2:2) Elementary treatment of topics in mechanics, heat, wave motion, and sound leading toward an understanding of technical applications. Prerequisite: 1-1/2 units of algebra. Prerequisite or concurrent: MATH 087 GQ.

151. TECHNICAL PHYSICS (3:2:2) Elementary treatment of topics in electricity, light, and modern physics leading toward an understanding of technical applications. Prerequisite: PHYS 150 DN.

201. (DN) GENERAL PHYSICS (4:4:0) Mechanics. Concurrent: MATH 140 GQ.

202. (DN) GENERAL PHYSICS (4:3:2) Electricity and magnetism. Prerequisite: PHYS 201 DN. Concurrent: MATH 141 GQ.

203. (DN) GENERAL PHYSICS (3:3:0) Wave motion, thermodynamics, and modern physics. Prerequisite: PHYS 202 DN.

204. (DN) GENERAL PHYSICS (4:3:2) Wave motion, thermodynamics, and modern physics, with laboratory. Prerequisite: PHYS 202 DN.

215. (DN) INTRODUCTORY PHYSICS (4:3:2) Selected topics in mechanics, heat, and sound. Prerequisite: algebra to quadratics.

221. (DN) FUNDAMENTALS OF PHYSICS (4:4:0) Classical and modern physics—mechanics. Designed primarily for science and engineering science majors. Concurrent: MATH 140 GQ.

222. (DN) FUNDAMENTALS OF PHYSICS (4:3:2) Classical and modern physics—electricity and magnetism. Designed primarily for science and engineering science majors. Prerequisite: PHYS 201 DN or 221 DN. Concurrent: MATH 141 GQ.

224. (DN) FUNDAMENTALS OF PHYSICS (4:3:2) Classical and modern physics—wave motion and thermodynamics. Designed primarily for science and engineering science majors.

225. FUNDAMENTALS OF PHYSICS (3:3:0) Classical and modern physics—quantum physics. Designed primarily for science and engineering science majors. Concurrent: PHYS 203 DN, 204 DN, or 224 DN.

237. INTRODUCTION TO QUANTUM PHYSICS (3:3:0) Relativity and quantum theory applied to selected topics in atomic, molecular, solid state, and nuclear physics. Concurrent: PHYS 203 DN, 204 DN, or 224 DN.

255. (DN) PHYSICS OF MUSIC AND SPEECH (3:3:0) Descriptive study of vibration and sound waves, hearing and speech, musical instruments, physical bases of harmony and scales.

265. (DN) INTRODUCTORY PHYSICS (4:3:2) Selected topics in light, electricity, and magnetism. Prerequisite or concurrent: PHYS 215 DN.

297. SPECIAL TOPICS (1-9)

PLANT SCIENCE (PLTSC)

200. ECOLOGY OF PLANT PRODUCTION (3:2:2) The influence of environment on the growth and development of plants as related to the technological aspects of crop production.

POLITICAL SCIENCE (PL SC)

001. (GS) INTRODUCTION TO AMERICAN NATIONAL GOVERNMENT (3:3:0) Introduction to development and nature of American political culture; constitutional/structural arrangements; electoral policy processes; sources of conflict and consensus.

002. AMERICAN PUBLIC POLICY (3:3:0) Examination of selected areas of public policy in America. Analysis of policy content, alternatives, and impact. Prerequisite: PL SC 001 GS.

003. (GS) INTRODUCTION TO COMPARATIVE POLITICS (3:3:0) Introduction to study of comparative government and politics: normative/empirical theories; government functions in modern societies; representative structures and processes.

014. (GS) INTERNATIONAL RELATIONS (3:3:0) Characteristics of modern nation-states and forces governing their international relations; nationalism; imperialism; diplomacy; current problems of war and peace. Credit will not be given for both this course and INT U 200 DS.

020. COMPARATIVE POLITICS—WESTERN EUROPE (3:3:0) Comparative analysis of political cultures, interest groups, parties, and decision-making processes in principal Western European political systems.

PORTUGUESE (PORT)

001. ELEMENTARY PORTUGUESE I (4:3:2) For beginners. Grammar, with reading and writing of simple Portuguese; oral and aural work stressed.

002. ELEMENTARY PORTUGUESE II (4:3:2) Grammar, reading, and conversation continued; special emphasis on the language, literature, and life of Brazil. Prerequisite: PORT 001.

003. INTERMEDIATE PORTUGUESE (4:3:2) Grammar, reading, composition, and conversation. Prerequisite: PORT 002.

187. PORTUGUESE FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

POULTRY SCIENCE (PTYSC)

201. INTRODUCTION TO POULTRY MANAGEMENT (1:1:0) Business management in the production, processing, and marketing of broilers, eggs, and turkeys.

202. COMMERCIAL POULTRY PRACTICE (2:0:4) Commercial management procedures and techniques; feeding practices, selection and mating, disease control, housing, equipment, ventilation, and processing. Prerequisite or concurrent: PTYSC 201.

PSYCHOLOGY (PSY)

002. (GS) PSYCHOLOGY (3:3:0) Introduction to general psychology; principles of human behavior and their applications.

015. ELEMENTARY STATISTICS IN PSYCHOLOGY (4:3:2) Frequency distributions and graphs; measure of central tendency and variability; normal probability curve; elementary sampling and reliability; correlations; simple regression equations. Prerequisites: PSY 002 GS; MATH 021 GQ or 2 units of secondary school algebra.

021. CURRENT APPLICATIONS OF PSYCHOLOGY (3:3:0) Topics may be drawn from but not limited to opinion research, selection and placement, behavior modification, attitude measurement and change. Prerequisite: PSY 002 GS.

170. (DS;DF) PSYCHOLOGY OF WOMEN (3:3:0) Psychology of women in historical perspective and present involvement. Stresses women's self-concepts with relation to individual and social psychological health. Prerequisite: PSY 002 GS.

174. (SOC) PSYCHOLOGICAL AND SOCIOLOGICAL ASPECTS OF DEATH (3:3:0) An introductory, interdisciplinary approach to the psychology and sociology of death, stressing the significance of, and attitudes toward, mortality. Prerequisites: PSY 002 GS, SOC 001 GS.

202. (DS) INTRODUCTION TO PERCEPTION (3:3:0) Survey of human perception and processing of perceptual information, with some reference to animal literature. Emphasizes vision and audition. Prerequisite: PSY 002 GS.

203. NEUROLOGICAL BASES OF HUMAN BEHAVIOR (3:3:0) An introduction to biopsychology, emphasizing the structure and function of the human brain.

204. (DS) INTRODUCTION TO LEARNING (3:3:0) A general survey of the learning area, including animal and human experiments, with the applicability of learning principles being discussed. Prerequisite: PSY 002 GS.

211. VOCATIONAL BEHAVIOR (3:3:0) Theories of vocational selection and career change; research and application.

213. (DS;DE) INTRODUCTION TO DEVELOPMENTAL PSYCHOLOGY (3:3:0) Developmental principles; physical growth; linguistic, intellectual, emotional, and social development from infancy to maturity. Prerequisite: PSY 002 GS.

220. (LING) (DS) INTRODUCTION TO PSYCHOLINGUISTICS (3:3:0) The learning of language; language development in the child; meaning as a problem for psychology. Prerequisite: PSY 002 GS.

221. (DS) INTRODUCTION TO COGNITIVE PSYCHOLOGY (3:3:0) Introduction to study of such higher mental processes as thinking and reasoning, imagery, concept formation, problem solving, and skilled performance. Prerequisite: PSY 002 GS.

231. (DS;DE) INDUSTRIAL PSYCHOLOGY (3:3:0) Personnel selection, training, accident prevention, morale, and organizational behavior. Prerequisites: PSY 002 GS.

QUANTITATIVE BUSINESS ANALYSIS

236. (RL ST) (DS) INTRODUCTION TO PSYCHOLOGIES OF RELIGION (3:3:0) Introduction to major Western psychologies of religion (James, Freud, Jung) and to subsequent extensions of and departures from them.
237. (RL ST) (DS) RELIGIONS, CULTURES, AND THERAPIES (3:3:0) Comparison of methods and goals of selected religious and secular therapies within their cultural contexts. Prerequisite: PSY 002 GS.
296. INDEPENDENT STUDIES (1-18)

QUANTITATIVE BUSINESS ANALYSIS (Q B A)

200. INTRODUCTION TO STATISTICS FOR BUSINESS (4:4:0) Introduction to business statistics, including topics in probability theory, sampling, inference, quality assurance, regression, forecasting, and simulations. Prerequisite: CMPSC 203 GQ, MATH 018 GQ, 110 GQ, or 140 GQ.
201. QUANTITATIVE METHODS FOR BUSINESS DECISIONS (3:3:0) Introduction to quantitative methods for conceptualizing business and management problems. Prerequisite: MATH 018 GQ, 021 GQ, 110 GQ, or 140 GQ.

RADIOLOGIC TECHNOLOGIST RADIOGRAPHER (R T R)

101. ORIENTATION AND MEDICAL TERMINOLOGY (3) Radiology history, radiation protection principles, medical ethics, with introduction to medical profession language.
102. RADIOGRAPHIC POSITIONING I: NURSING PROCEDURES/CONTRAST MEDIA (3) Basic positional terminology; emphasis on skeleton with introduction to skull; radiological applications of contrast media and nursing pertinent to radiology. Prerequisite: R T R 101.
103. RADIOGRAPHIC EXPOSURE I: FILM CRITIQUE I (3) Preliminary exposure factors concerning radiographic imaging; evaluation of radiographic films. Prerequisite: R T R 102.
104. RADIOGRAPHIC POSITIONING II: SPECIAL PROCEDURES (3) Cranium and body system positioning; invasive contrast procedures pertinent to radiology. Prerequisites R T R 103.
105. RADIOGRAPHIC EXPOSURE II: DARKROOM CHEMISTRY; FILM CRITIQUE II (3) Continuation of exposure factors concerning radiographic imaging, with emphasis on problem solving, evaluation of radiographs, and radiographic chemistry with processing techniques. Prerequisite: R T R 104.
106. RADIOGRAPHIC POSITIONING III: MEDICAL/SURGICAL DISEASES (3) Review of skeletal, cranium, and body systems, with emphasis on specialized positioning. Definition of various pathologies pertinent to bodily systems. Prerequisites: BIOL 014, R T R 105.
107. REGISTRY REVIEW I AND II (3:5:17) Registry Review I and II includes material in all required R T R courses, with emphasis upon national board examination. Prerequisite: R T R 106.

REAL ESTATE (R EST)

100. REAL ESTATE PRACTICE (3:3:0) Study of real estate to enable individuals to make successful transactions and decisions. Not available to baccalaureate students or to those who have taken R EST 301.
301. REAL ESTATE FUNDAMENTALS (3:3:0) Introduction to urban real estate; economic forces affecting property rights; real estate markets and finance; land-use analysis; government policies.

RELIGIOUS STUDIES (RL ST)

Note: For a complete list of Religious Studies courses that satisfy the General Education program requirements, see the Penn State *Baccalaureate Degree Programs Bulletin*.

001. (GH;DF) INTRODUCTION TO WORLD RELIGIONS (3:3:0) A historical and comparative survey of the principal beliefs and practices of the world's major religions.
003. (GH;DF) INTRODUCTION TO THE RELIGIONS OF THE EAST (3:3:0) Religious experience, thought, patterns of worship, morals, and institutions in relation to culture in Eastern religions.
004. (GH;DF) JEWISH AND CHRISTIAN FOUNDATIONS (3:3:0) Introduction to the perspectives, patterns of worship, morality, historical roots, and institutions of the Judaeo-Christian traditions; their relationships to culture.
140. (DH) RELIGION IN AMERICAN LIFE AND THOUGHT (3:3:0) The function, contributions, tensions, and perspectives of religion in American culture.
145. (BL ST) (DH;DF) AFRO-AMERICAN RELIGION (3:3:0) History and significance of the religious dimension from enslavement to the civil rights movement and contemporary churches and sects.
146. (BL ST) (DH;DF) THE LIFE AND THOUGHT OF MARTIN LUTHER KING, JR. (3:3:0) A survey of the civil rights leader including his religious beliefs, intellectual development, and philosophy for social change.

RURAL SOCIOLOGY (R SOC)

- * 011. (GS) INTRODUCTORY RURAL SOCIOLOGY (3:3:0) Basic sociological concepts applied to rural societal institutions and change in rural communities, some historical causes and current consequences.

RUSSIAN (RUS)

001. ELEMENTARY RUSSIAN I (4:3:2) Audio-lingual approach to basic Russian; writing. Students who have received high school credit for two or more years of Russian may not schedule this course for credit without permission of the department.

002. ELEMENTARY RUSSIAN II (4:3:2) Audio-lingual approach to basic Russian continued; writing. Students who have received high school credit for four years of Russian may not schedule this course for credit without permission of the department. Prerequisite: RUS 001.

003. INTERMEDIATE RUSSIAN (4:3:2) Emphasis on reading unsimplified texts; composition; grammatical analysis. Prerequisite: RUS 002.

005. ELEMENTARY TECHNICAL RUSSIAN: ACQUISITION OF SKILLS IN READING (4:3:2) An introduction to the study of Russian grammar and the theory and practice of translation.

006. RUSSIAN TEXTS AND ELEMENTARY TECHNICAL WRITING (4:3:2) Instruction in the theory and techniques of translation and elementary technical writing. Prerequisite: RUS 005 or 001G.

100. (GH;DF) RUSSIAN CULTURE AND CIVILIZATION (3:3:0) The Russian people from the tenth century to present times; their literature, arts, music, science, and philosophy. In English.

110. (DH) RUSSIAN FOLKLORE (3:3:0) Study of *byliny*, lyrical and historical songs, folktales, drama, ceremonial poetry, chants, charms, proverbs, and mythology of Russia. In English.

120. (DH) THEATRICAL ARTS OF RUSSIA (3:3:0) Survey of Russian dramatic literature, including plays, operas, ballets, and cinema. In English.

141W. RUSSIAN LITERATURE IN ENGLISH TRANSLATION: 1800–1870 (3:3:0) Pushkin, Lermontov, Gogol, the critics, Turgenev, Dostoevsky, Tolstoy. Writing assignments will serve as a major way of exploring subject matter.

142W. RUSSIAN LITERATURE IN ENGLISH TRANSLATION: 1870–PRESENT (3:3:0) Dostoevsky, Tolstoy, Chekhov, Gorky, symbolists, selected Soviet authors. Writing assignments will serve as a major way of exploring subject matter.

187. RUSSIAN FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

204. READINGS IN RUSSIAN I (3:3:0) Intensive reading of Russian texts, mainly short fiction of classic Russian authors; conversation; composition. Prerequisite: RUS 003 or 006.

214. READINGS IN RUSSIAN II (3:3:0) Intensive readings of Russian texts, mainly nineteenth-century memoirs and intellectual history; conversation; composition. Prerequisite: RUS 003 or 006.

221. RUSSIAN CONVERSATION (3:3:0) Practice aimed at developing fluency in the use of the grammatical constructions and vocabulary essential for everyday conversation. Prerequisite: RUS 003 or 006.

296. INDEPENDENT STUDIES (1–18)

297. SPECIAL TOPICS (1–9)

SCIENCE, TECHNOLOGY, AND SOCIETY (S T S)

100. (GH) THE ASCENT OF HUMANITY (3:3:0) A survey of some of the intellectual achievements that highlight humanity's attempts to understand nature and shape the environment.

105. (FD SC) (GHS) FOOD FACTS AND FADS (3:3:0) Impact on society and the individual of modern food technology, food laws, additives, etc.; historical, current, and futuristic aspects.

SERBO-CROATIAN (S CR)

001-002-003. BEGINNING SERBO-CROATIAN (4:3:2 each) An elementary course to enable the student to achieve a measure of proficiency in reading and speaking Serbo-Croatian.

*Students may take only one course for General Education credit from R SOC 011 GS or SOC 001 GS.

SLAVIC (SLAV)

187. SLAVIC FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

296. INDEPENDENT STUDIES (1-19)

SOCIAL SCIENCE (SO SC)

001. (DS) URBANIZATION (3:3:0) An overview of the social sciences, including an interdisciplinary analysis of the urban process.

002. CONTEMPORARY SOCIETY (3:3:0) Selected contemporary issues in the perspective of history, sociology, psychology, economics, and political science.

110. (DS) INTRODUCTION TO CONTEMPORARY AFRICA (3:3:0) Consideration of influences and forces at work; leaders, elites, and groups. Analysis of problems and issues in Africa.

297. SPECIAL TOPICS (1-9)

SOCIAL WORK (SOC W)

250. (DS) INTRODUCTION TO SOCIAL WORK AND SOCIAL WELFARE (3:3:0) Origins and development of a "caring" philosophy; public and private social welfare programs; social work roles in a changing society. Prerequisite: sophomore standing.

SOCIOLOGY (SOC)

* 001. (GS) INTRODUCTORY SOCIOLOGY (3:3:0) The nature and characteristics of human societies and social life.

003. (GS) INTRODUCTORY SOCIAL PSYCHOLOGY (3:3:0) The impact of the social environment on perception, attitudes, and behavior.

005. (GS) SOCIAL PROBLEMS (3:3:0) Current social problems such as economic, racial, and gender inequalities; social deviance and crime; population, environmental, energy, and health problems.

007. INTRODUCTION TO SOCIAL RESEARCH (3:3:0) Fundamental concepts and problems in social science research; design, measurement, sampling, causation, validity, interpretation. Prerequisite: 3 credits in sociology.

012. (DS) CRIMINOLOGY (3:3:0) Explanations and measurement of crime; criminal law; characteristics of criminals and victims; violent, property, white-collar, organized, and sexual crimes.

013. (DS) JUVENILE DELINQUENCY (3:3:0) Juvenile conduct, causes of delinquency, current methods of treatment; organization and function of agencies concerned with delinquency.

015. (DS) URBAN SOCIOLOGY (3:3:0) City growth and decline; impact of city life on individuals, families, neighborhoods, and government; urban life-styles.

023. (DS) POPULATION AND POLICY ISSUES (3:3:0) Local, national, and international population trends; basic techniques of demographic analysis; population problems; implications for public planning and policy.

† 030. (GS) SOCIOLOGY OF THE FAMILY (3:3:0) Family structure and interaction; functions of the family as an institution: cross-cultural comparisons.

047. (S T S) WILDERNESS, TECHNOLOGY, AND SOCIETY (3:3:0) Impact of developments in science, literature, and art on changing attitudes toward nature; consequences for conservation, preservation, environmental ethics.

055. (DS) WORK IN MODERN SOCIETY (3:3:0) The nature of work in varied occupational and organizational settings; current trends and work life in the future.

110. (WMNST) (DS;DF) THE SOCIOLOGY OF SEX ROLES (3:3:0) Changing sex role expectations and behavior for men and women in contemporary society.

119. (DS;DF) RACE AND ETHNIC RELATIONS (3:3:0) Historical patterns and current status of racial and ethnic groups; inequality, competition, and conflict; social movements; government policy.

*Students may take only one course for General Education credit from R SOC 011 GS or SOC 001 GS.

†Students may take only one course for General Education credit from HD FS 129 GS;DE or SOC 030 GS.

SPANISH (SPAN)

001. ELEMENTARY SPANISH I (4:3:2) Audio-lingual approach to basic Spanish; writing. Students who have received high school credit for two or more years of Spanish may not schedule this course for credit without permission of the department.

002. ELEMENTARY SPANISH II (4:3:2) Audio-lingual approach to basic Spanish continued; writing. Students who have received high school credit for four years of Spanish may not schedule this course for credit without permission of the department. Prerequisite: SPAN 001.

003. INTERMEDIATE SPANISH (4:3:2) Audio-lingual review of structure; writing; reading. Prerequisite: SPAN 002.

010. INTENSIVE SPANISH (6:5:2) Basic Spanish grammar; oral, aural, and writing skills. (This course is essentially equivalent to SPAN 001, and first half of SPAN 002.)

020. INTENSIVE SPANISH (6:5:2) Basic and intermediate Spanish grammar, oral, aural, and writing skills. (This course is essentially equivalent to the second half of SPAN 002 and all of SPAN 003.)

130. (GH;DF) IBERIAN CIVILIZATION (3:3:0) Spanish and Portuguese life from the medieval period to the present; literature, the arts, and contemporary problems in historical perspective.

131. (GH;DF) IBERO-AMERICAN CIVILIZATION (3:3:0) Spanish American and Brazilian life from the Conquest to the present: literature, art, the indigenous heritage, and contemporary problems.

230. (DH) MASTERPIECES OF SPANISH LITERATURE IN ENGLISH TRANSLATION (3:3:0) Emphasis on works and authors of international importance. Lectures, readings, and written work in English.

231. (DH) MASTERPIECES OF SPANISH AMERICAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Emphasis on works and authors of international importance. Lectures, readings, and written work in English.

SPEECH COMMUNICATION (SPCOM)

100. (GWS) EFFECTIVE SPEECH (3:3:0) Introduction to speech communication: formal speaking, group discussion, analysis and evaluation of messages.

STATISTICS (STAT)

100. (GQ) STATISTICAL CONCEPTS AND REASONING (3:3:0) Introduction to the art and science of decision making in the presence of uncertainty.

200. (GQ) ELEMENTARY STATISTICS (4:3:2) Descriptive statistics, frequency distributions, probability, binomial and normal distributions, statistical inference, linear regression, and correlation. Prerequisite: 2 units in algebra.

250. (GQ) INTRODUCTION TO BIOSTATISTICS (3:3:0) Statistical analysis and interpretation of data in the biological sciences; probability; distributions; statistical inference for one- and two-sample problems. Prerequisite: MATH 017 or 3 credits of calculus.

301. (GQ) STATISTICAL ANALYSIS I (3:3:0) Probability concepts; nature of statistical methods; elementary distribution and sampling theory; fundamental ideas relative to estimation and testing hypotheses. Prerequisite: 3 credits of calculus.

318. ELEMENTARY PROBABILITY (3:3:0) Combinatorial analysis, axioms of probability, conditional probability and independence, discrete and continuous random variables, expectation, limit theorems, additional topics. Students who have passed either STAT (MATH) 414 or 418 may not schedule this course for credit. Prerequisite: MATH 141 GQ.

TELECOMMUNICATIONS (TELCM)

140. INTRODUCTION TO TELECOMMUNICATIONS SYSTEMS (2:2:0) Elements of telecommunications systems, including telephones, transmission lines, switching, digital data, and transmission by microwave, satellite, and fiber optics.

241. SWITCHING AND TRAFFIC (3:3:0) Routing of telecommunications messages: characteristics, methods, and control. Prerequisite: TELCM 140.

242. INTRODUCTION TO TELECOMMUNICATIONS LABORATORY (1:0:2) Techniques used for measurements of basic telecommunications circuits and equipment. Prerequisite or concurrent: TELCM 241.

243. TRANSMISSION (3:3:0) Transmission of telecommunications information, including design problems. Prerequisite: TELCM 140.

244. ADVANCED TELECOMMUNICATIONS LABORATORY (1:0:2) Testing and measurement of advanced telecommunication transmission and switching equipment, including practical alignment and testing of operational systems. Prerequisite or concurrent: TELCM 243.

THEATRE ARTS (THEA)

100. (GA) THE ART OF THE THEATRE (3:3:0) Survey of the history, craft, and art of the theatre to support an informed appreciation of theatrical events.
102. (DA) FUNDAMENTALS OF ACTING (3:3:0) Introduction to performance skills for nontheatre majors.
103. FUNDAMENTALS OF DIRECTING (3:3:0) Training and experience in basic skills of directing. Designed for non-Theatre majors.
104. FUNDAMENTALS OF THEATRE PRODUCTION (3:3:0) Training and experience in basic skills of technical theatre. Designed for nontheatre majors.
109. (DA) THE DRAMATIC ARTS IN THE MASS MEDIA (3:3:0) The place of television-radio-film drama in our culture; relationship with other art forms; standards of evaluation.
160. INTRODUCTION TO COSTUME CRAFTS (3:2:4) Process of costuming combined with laboratory projects. Crew experience on major productions.
170. INTRODUCTION TO STAGE LIGHTING PRODUCTION TECHNIQUES (3:2:4) Introduction to theatre lighting facilities, equipment, and practice. Practical experience with major productions.
180. INTRODUCTION TO STAGECRAFT (3:2:4) Introduction to methods, materials, and equipment used in scenic construction for the theatre. Practical experience with departmental productions.
210. INTRODUCTION TO CREATIVE DRAMATICS (3:1:4) Introduction and direct experience in creative drama and survey of children's theatre.
296. INDEPENDENT STUDIES (1-18)

WILDLIFE (WIDL)

101. INTRODUCTION TO WILDLIFE MANAGEMENT (3:3:0) Basic principles of wildlife management. Introduction to general ecology and wildlife population dynamics.
103. ANIMAL IDENTIFICATION (3:2:3) Identification of mammals, birds, reptiles, and amphibians; introduction to their life histories.
106. WILDLIFE MANAGEMENT TECHNIQUES (4:3:3) Overview of laboratory and field techniques for natural resource research and management; scientific writing and computer applications emphasized. Prerequisite: WIDL 101.
204. WILDLIFE MENSURATION (4:4:0) Estimation and analysis of animal populations and their habitats, including sampling considerations and basic biometry. Prerequisite: 3 credits in mathematics.
207. OUTDOOR RECREATION (3:2:3) Sociology, history, and economics of recreational demand; recreational areas and management procedures.
208. TERRESTRIAL WILDLIFE MANAGEMENT (3:2:4) Ecological characteristics and manipulation of terrestrial habitats; control of wildlife populations. Prerequisites: FOR 240, 250, WIDL 101, 103, 106.
209. ANIMAL HANDLING AND CARE (4:3:3) Techniques in capturing, marking, and maintaining wild animals in captivity. Wildlife physiology, parasitology, and necropsy procedures are covered. Prerequisite: WIDL 101.
211. AERIAL PHOTO INTERPRETATION (4:2:6) Techniques of photo interpretation; type mapping of wildlife environments; photo censusing of wild animals.
213. WETLANDS AND FISHERIES MANAGEMENT (3:3:3) Introduction to basic limnology. Ecology and management of swamp, marsh, pond, and stream habitats and their animal populations. Prerequisites: WIDL 101, 103, 106, 204.

WOMEN'S STUDIES (WMNST)

001. (GS;DF) WOMEN'S STUDIES (3:3:0) Interdisciplinary consideration of the scholarly theories and research pertaining to women's experiences and women's status in contemporary American society.
110. (SOC) (DS) THE SOCIOLOGY OF SEX ROLES (3:3:0) Changing sex role expectations and behavior for men and women in contemporary society.
194. (ENGL) (DH;DF) WOMEN WRITERS (3:3:0) Short stories, novels, poetry, drama, and essays by British, American, and other English-speaking women writers.
205. (COMM) (DF) WOMEN, MINORITIES, AND THE MEDIA (3:3:0) Analysis of historical, economic, legal, political, and social implications of the relationship among women, minorities, and the mass media.

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UNIVERSITY CALENDAR*

SPRING SEMESTER 1994

JANUARY

- 5 Wednesday—Arrival day
- 7 Friday—Registration deadline
- 10 Monday—Classes begin

MARCH

- 7–11 Spring holiday, no classes

APRIL

- 29 Friday—Classes end
- 30 Saturday—Study day

MAY

- 1 Sunday—Study day
- 2–7 Monday to Saturday—Final examinations
- 14, 15 Saturday, Sunday—Spring commencement

SUMMER SESSION 1994

Intercession

MAY

- 9 Monday—Classes begin
- 30 Monday—Memorial Day holiday, no classes

JUNE

- 3 Friday—Classes end

Eight-Week Session

JUNE

- 5 Sunday—Arrival day
- 7 Tuesday—Registration deadline
- 8 Wednesday—Classes begin

JULY

- 4 Monday—Independence Day holiday, no classes#

AUGUST

- 3 Wednesday—Classes end
- 4–6 Thursday to Saturday—Final examinations
- 13 Saturday—Summer commencement

Six-Week Session

JUNE

- 22 Wednesday—Classes begin

AUGUST

- 3 Wednesday—Classes end
- 4–6 Thursday to Saturday—Final examinations

*This calendar is subject to change without notice. Although the University makes every effort to avoid conflicts with religious holidays in preparing the calendar for an academic year, such conflicts are sometimes unavoidable. When they occur, efforts are made to make special arrangements for the students affected.

#Classes that would have met on Monday, July 4, 1994, will meet on Wednesday, August 3, 1994.

FALL SEMESTER 1994

AUGUST

- 20 Saturday—Arrival day for new students
- 21 Sunday—Arrival day for returning students
- 23 Tuesday—Registration deadline
- 24 Wednesday—Classes begin

SEPTEMBER

- 5 Monday—Labor Day holiday, no classes⁺

NOVEMBER

- 24–27 Thursday to Sunday—Thanksgiving holiday, no classes

DECEMBER

- 9 Friday—Classes end
- 10, 11 Saturday, Sunday—Study days
- 12–17 Monday to Saturday—Final examinations

JANUARY 1995

- 7 Saturday—Fall commencement

SPRING SEMESTER 1995

JANUARY

- 4 Wednesday—Arrival day
- 6 Friday—Registration deadline
- 9 Monday—Classes begin

MARCH

- 6–10 Spring holiday, no classes

APRIL

- 28 Friday—Classes end
- 29, 30 Saturday, Sunday—Study days

MAY

- 1–6 Monday to Saturday—Final examinations
- 13, 14 Saturday, Sunday—Spring commencement

SUMMER SESSION 1995

Intercession

MAY

- 8 Monday—Classes begin
- 29 Monday—Memorial Day holiday, no classes

JUNE

- 2 Friday—Classes end

Eight-Week Session

JUNE

- 4 Sunday—Arrival day
- 6 Tuesday—Registration deadline
- 7 Wednesday—Classes begin

JULY

- 4 Tuesday—Independence Day holiday, no classes[†]

AUGUST

- 2 Wednesday—Classes end
- 3–5 Thursday to Saturday—Final examinations
- 12 Saturday—Summer commencement

Six-Week Session

JUNE

- 21 Wednesday—Classes begin

AUGUST

- 2 Wednesday—Classes end
- 3–5 Thursday to Saturday—Final examinations

⁺Classes that would have met on Monday, September 5, 1994, will meet on Wednesday, December 7, 1994.

[†]Classes that would have met on Tuesday, July 4, 1995, will meet on Wednesday, August 2, 1995.

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ALBERT N. SKOMRA, Ed.D. *Campus Executive Officer*
FREDRIC M. LEEDS, A.B., M.A., Ph.D. *Director of Academic Affairs*
DAVID A. ENGLISH, B.A. *Director of Continuing and Distance Education*
ROBERT DEWITT, B.A., M.Ed., Ph.D. *Regional Director of Student Affairs*
THOMAS F. HOFFACKER, B.A. *Director of Business Services*
RICHARD G. LENZI, B.S., M.B.A. *Director of Business and Finance*
PAULA BITTLER, B.A. *Acting Director of University Relations*

WILKES-BARRE

WILLIAM A. PEARMAN, B.A., M.A., Ph.D. *Campus Executive Officer*
GEORGE W. BIERLY, B.S. *Director Emeritus*
PAUL SCHWARTZ, B.A., Ph.D. *Director of Academic Affairs*
INA K. LUBIN, B.A., M.B.A. *Director of Continuing and Distance Education*
JOHN R. MURPHY, B.A., M.S. *Director of Student Affairs*
PHYLLIS BELK, B.A., M.Ed. *Director of University Relations*
THOMAS R. ROBINSON, B.S. *Director of Development*
EUGENE J. DANOWSKI, B.S., M.B.A. *Financial Officer, Director of Business Services*

WORTHINGTON SCRANTON

JAMES D. GALLAGHER, B.S., M.S., Ph.D. *Campus Executive Officer*
ROBERT E. DAWSON, Ph.B., M.A. *Director Emeritus*
K. BRUCE SHERBINE, B.S., M.S., Ph.D. *Director of Academic Affairs*
JOHN PATRILAK, B.S. *Director of Continuing and Distance Education*
PATRICK J. ROSE, B.S., M.S. *Director of Student Affairs*
MARIA RUSSONIELLO, B.A., M.A. *Director of University Relations*
EUGENE T. GROGAN, B.S. *Financial Officer*

YORK

DONALD A. GOGNIAT, B.S., M.A., Ph.D. *Acting Campus Executive Officer*
EDWARD M. ELIAS, B.S., M.A. *Campus Executive Officer Emeritus*
JOHN R. MADDEN, B.A., Ph.D. *Director of Academic Affairs*
TERRY L. RILEY, B.S. *Acting Director of Continuing and Distance Education*
SHARON E. MACK, B.S., M.A. *Director of Student Affairs*
TERRY K. ENGDAHL, B.A., M.S. *Director of University Relations*
SUSAN E. WERNER, B.S. *Financial Officer*
HOLLY L. GUMKE, B.S. *Director of Business Services*

PENN STATE LOCATIONS

UNIVERSITY PARK CAMPUS
UNIVERSITY PARK PA 16802
(814) 865-4700

ALLENTOWN CAMPUS
8400 MOHR LANE
FOGELSVILLE PA 18051-9999
(215) 285-5000

ALTOONA CAMPUS
3000 IVYSIDE PARK
ALTOONA PA 16601-3760
(814) 949-5000

BEAVER CAMPUS
BRODHEAD ROAD
MONACA PA 15061-2799
(412) 773-3500

BERKS CAMPUS
TULPEHOCKEN ROAD
P O BOX 7009
READING PA 19610-6009
(215) 320-4800

DELAWARE COUNTY CAMPUS
25 YEARSLEY MILL ROAD
MEDIA PA 19063-5596
(215) 892-1350

DUBOIS CAMPUS
COLLEGE PLACE
DUBOIS PA 15801-3199
(814) 375-4700

UNIVERSITY ADMINISTRATION

FAYETTE CAMPUS
ONE UNIVERSITY DRIVE
P O BOX 519
UNIONTOWN PA 15401-0519
(412) 430-4100

HAZLETON CAMPUS
HIGHACRES
HAZLETON PA 18201-1291
(717) 450-3000

THE MILTON S. HERSHEY MEDICAL
CENTER
500 UNIVERSITY DRIVE
HERSHEY PA 17033-2390
(717) 531-8521

McKEESPORT CAMPUS
UNIVERSITY DRIVE
MCKEESPORT PA 15132-7698
(412) 675-9000

MONT ALTO CAMPUS
CAMPUS DRIVE
MONT ALTO PA 17237-9703
(717) 749-6000

NEW KENSINGTON CAMPUS
3550 SEVENTH STREET ROAD
NEW KENSINGTON PA 15068-1798
(412) 339-5466

OGONTZ CAMPUS
1600 WOODLAND ROAD
ABINGTON PA 19001-3990
(215) 881-7300

PENN STATE ERIE
THE BEHREND COLLEGE
STATION ROAD
ERIE PA 16563-0101
(814) 898-6000

* PENN STATE GREAT VALLEY
30 EAST SWEDES FORD ROAD
MALVERN PA 19355-1443
(215) 648-3200

* PENN STATE HARRISBURG
777 WEST HARRISBURG PIKE
MIDDLETOWN PA 17057-4898
(717) 948-6000

SCHUYLKILL CAMPUS
200 UNIVERSITY DRIVE
SCHUYLKILL HAVEN PA 17972-2208
(717) 385-6000

SHENANGO CAMPUS
147 SHENANGO AVENUE
SHARON PA 16146-1537
(412) 983-5800

WILKES-BARRE CAMPUS
P O BOX PSU
LEHMAN PA 18627-0217
(717) 675-2171

WORTHINGTON SCRANTON CAMPUS
120 RIDGE VIEW DRIVE
DUNMORE PA 18512-1699
(717) 963-4766

YORK CAMPUS
1031 EDGE COMB AVENUE
YORK PA 17403-3398
(717) 771-4000

*Upper-division and graduate courses

| | BEAVER | PENN STATE-BEHREND | BERKS | DELAWARE COUNTY | DuBOIS | FAYETTE | HAZLETON | HERSHEY(MEDICAL CENTER) †† | McKEESPORT | MONT ALTO | NEW KENSINGTON | OGONTZ | SCHUYLKILL | SHENANGO | UNIVERSITY PARK | WILKES-BARRE | WORTHINGTON SCRANTON | YORK | |
|--|--------|--------------------|-------|-----------------|--------|---------|----------|----------------------------|------------|-----------|----------------|--------|------------|----------|-----------------|--------------|----------------------|------|---|
| | | | | | | | | | | | | | | | | | | | Associate Degree Majors |
| | | | | | | | | | | | | | | | | | | | Agricultural Business (1) |
| | | | | | | | | | | | | | | | | | | | Architectural Engineering Technology |
| | | | | | | | | | | | | | | | | | | | Biomedical Equipment Technology (2) |
| | | | | | | | | | | | | | | | | | | | Business Administration† |
| | | | | | | | | | | | | | | | | | | | Computer Engineering Technology (5) |
| | | | | | | | | | | | | | | | | | | | Computer Science |
| | | | | | | | | | | | | | | | | | | | Dietetic Food Systems Management# |
| | | | | | | | | | | | | | | | | | | | Electrical Engineering Technology |
| | | | | | | | | | | | | | | | | | | | Forest Technology |
| | | | | | | | | | | | | | | | | | | | Hotel, Restaurant, and Institutional Management |
| | | | | | | | | | | | | | | | | | | | Human Development and Family Studies |
| | | | | | | | | | | | | | | | | | | | Letters, Arts and Sciences* |
| | | | | | | | | | | | | | | | | | | | Materials Engineering Technology (3) |
| | | | | | | | | | | | | | | | | | | | Mechanical Engineering Technology |
| | | | | | | | | | | | | | | | | | | | Medical Laboratory Technology (4) |
| | | | | | | | | | | | | | | | | | | | Nursing |
| | | | | | | | | | | | | | | | | | | | Occupational Therapy |
| | | | | | | | | | | | | | | | | | | | Physical Therapist Assistance |
| | | | | | | | | | | | | | | | | | | | Science—General Option |
| | | | | | | | | | | | | | | | | | | | Science—Radiologic Technologist |
| | | | | | | | | | | | | | | | | | | | Radiographer Option |
| | | | | | | | | | | | | | | | | | | | Sociology* |
| | | | | | | | | | | | | | | | | | | | Surveying Technology |
| | | | | | | | | | | | | | | | | | | | Telecommunications Technology (6) |
| | | | | | | | | | | | | | | | | | | | Wildlife Technology |

- (1) Second year offered only at University Park
(2) Second year offered only at New Kensington and Wilkes-Barre
(3) Second year offered only at DuBois
(4) Second year offered only at Hazleton and New Kensington
Admission to this program is highly competitive.
(5) Second year offered only at New Kensington
(6) Second year offered only at McKeesport and Wilkes-Barre

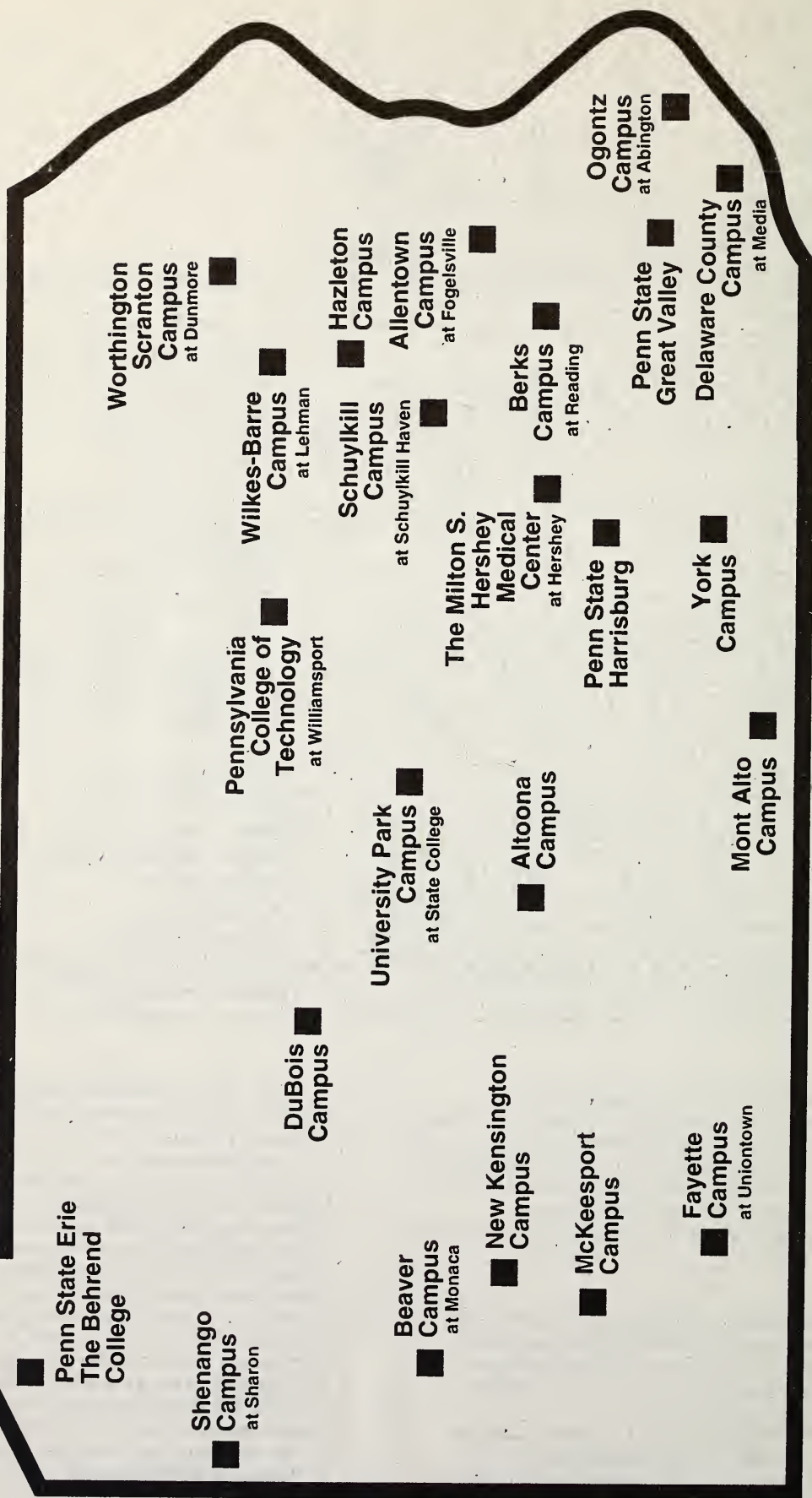
The two-year Business Administration major offered at Penn State-Behrend, The Milton S. Hershey Medical Center, Ogontz, and University Park is intended for nontraditional students who want to pursue part-time (primarily evening) study.
All programs offered at the Medical Center except the Science R T R option are intended primarily for nontraditional students who want to pursue part-time

(primarily evening) study. Students interested in part-time study should write to Penn State Harrisburg, Continuing Education Credit Program, 777 W. Harrisburg Pike, Middletown, PA 17057-4898.

*Letters, Arts, and Sciences may be taken as a degree program at all University locations. Interested students should write to the Admissions Office or the nearest Penn State campus to request applications.

#This program is available primarily through the Department of Independent Learning. Interested students should write to the Undergraduate Admissions Office at University Park, the Continuing and Distance Education office at the nearest Penn State campus, or the Department of Independent Learning, The Pennsylvania State University, 128 Mitchell Building, University Park, PA 16802-3600 for more information and to request a special application for extended degree programs.

Penn State locations



THE UNIVERSITY

MISSION OF THE UNIVERSITY

The Pennsylvania State University, a major multicampus institution serving all regions of the Commonwealth, is devoted to learning and service enlightened by vigorous research and scholarship. As a land-grant university, Penn State provides high-quality teaching in a wide array of undergraduate and graduate programs in the arts, humanities, and sciences, as well as in a balanced offering of programs in professional and technical disciplines. As the preeminent institution of higher education in Pennsylvania, and as one of the leading research universities of the nation and the world, Penn State accepts the dual responsibility to excel and to serve both the public and private sectors of our society.

Penn State shares three traditional responsibilities with other major universities:

—*Education.* Penn State strives to create new dimensions in the lives of its students by introducing them to the collective knowledge, wisdom, and experience of human society, by encouraging them to acquire the skills and intellectual discipline to comprehend the complexities of our times, and by motivating them to consider the values and aspirations that will guide their future.

—*Research.* Penn State strives to broaden human horizons by promoting scholarship, creativity, and the advancement of knowledge, thus enhancing our understanding of ourselves and the many worlds around us.

—*Service.* Penn State strives to contribute to economic and societal vitality by offering informed views on critical and recurring issues, by providing opportunities for cultural and intellectual enrichment, and by contributing new ideas and new techniques to advance both private and public endeavors.

The University encourages the interplay of individual creativity and intellectual diversity as the source of true understanding; it cultivates appreciation of human capabilities and human diversity as the pathway to individual and societal achievement and self-esteem. Penn State is thus committed to creating and maintaining an intellectual and an educational environment that reflects diverse values and needs; it fosters appreciation of a multicultural human society and seeks greater involvement with our increasingly interdependent world.

Penn State is a single university with many campuses, many strengths, and many ambitions. It is uniquely qualified to provide academic programs, continuing education, and public service and economic development programs that enhance the well-being of all citizens of the Commonwealth and the nation.

RESERVATIONS

The University reserves the right to make such program or class changes as may become necessary because of insufficient enrollment or other contingencies. The University also reserves the right to make any necessary changes in tuition and charges without prior notice. Courses and programs described in this bulletin also are subject to change without notice.

RESIDENT INSTRUCTION

The undergraduate degree programs of the University provide students with opportunities to increase their knowledge and understanding of the world, and to grow in their individual skills and capabilities for learning, analyzing, judging, creating, and communicating. All undergraduate degree programs and courses offered by the colleges and other degree-granting units of the University are under the academic sponsorship of a faculty committed to scholarship and are implemented under the academic policies and student rules established by the University Faculty Senate. They are intended to be flexible in accommodating students interested in learning, whether through tradition-

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al or nontraditional offerings, while enrolled on either a part-time or a full-time basis. The degree programs and courses of the colleges and other degree-granting units are offered through University administrative arrangements identified as Resident Instruction and Continuing and Distance Education. The primary mission of Resident Instruction is to provide credit courses to degree candidates on University campuses as well as to administer certain off-campus credit-granting activities such as internships, practicums, field trips, and foreign studies. Students not formally admitted to degree candidacy (including provisional and nondegree students) may participate in Resident Instruction offerings as time and space permit.

HISTORY

THE PENNSYLVANIA STATE UNIVERSITY, chartered by the Pennsylvania Legislature as the Farmers' High School in 1855, was founded by professional men, educated farmers, and state and county agricultural leaders. A faculty of four met the incoming class of sixty-nine students in February 1859.

In May 1862, the institution was renamed the Agriculture College of Pennsylvania, a name that recognized that its work was of collegiate level. Two months later, on July 2, President Abraham Lincoln signed the Morrill Land Grant Act, offering each state free public land that it could sell to endow institutions of higher learning where "the leading object shall be to teach such branches of learning as are related to agriculture and the mechanic arts . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

On April 1, 1863, the state legislature declared that the Morrill Act "is hereby accepted by the State of Pennsylvania with all its provisions and conditions and the faith of the State is hereby pledged to carry the same into effect." The legislature then designated Penn State as the land-grant college of the Commonwealth.

The college broadened the scope of its instruction, began to admit female students, increase its enrollment, and enlarge its physical plant. Graduate work was offered as early as 1862. In 1874, the college was renamed the Pennsylvania State College.

In 1953, the name was changed again—to The Pennsylvania State University—in formal recognition of what Penn State had long since become, one of the country's leading universities. Its nine undergraduate colleges and the School of Communications now offer 134 baccalaureate and 24 associate degree majors. Penn State Erie, The Behrend College, offers 21 complete baccalaureate programs. Penn State Harrisburg offers 30 baccalaureate degree majors. Graduate students may choose from 145 approved fields of study. The College of Medicine at The Milton S. Hershey Medical Center in Hershey offers the M.D. degree, the M.S. and Ph.D. in anatomy, bioengineering, biological chemistry, cell and molecular biology, genetics, microbiology and immunology, neuroscience, pharmacology, and physiology, and the M.S. degree in laboratory animal medicine.

The original student body of 69 has grown to 68,553, the faculty of four to 5,021. Beginning with an educational program that offered 40 courses, Penn State today offers 5,222 undergraduate, 3,463 graduate courses, and 162 medical courses. The University, whose prime purpose has always been to serve the people and the interests of the Commonwealth and the nation, is accredited by the Middle States Association and is a member of the Association of American Universities.

ACADEMIC ORGANIZATION OF THE UNIVERSITY

COLLEGES AND OTHER DEGREE-GRANTING UNITS

The University has nine colleges and one school that offer undergraduate majors leading to baccalaureate and associate degrees: College of Agricultural Sciences, College of Arts and Architecture, The Mary Jean and Frank P. Smeal College of Business Administration, College of Earth and Mineral Sciences, College of Education, College of Engineering, College of Health and Human Development, College of the Liberal Arts, Eberly College of Science, and the School of Communications. Penn State Erie, The Behrend College, Penn State Harrisburg in Middletown, and the Pennsylvania College of Technology in Williamsport provide alternative educational settings in which students may enroll in selected degree programs.

THE COMMONWEALTH EDUCATIONAL SYSTEM

THE COMMONWEALTH EDUCATIONAL SYSTEM—CES is composed of the seventeen Commonwealth Campuses and the Penn State Great Valley Graduate Center.

COMMONWEALTH CAMPUSES—Full- and part-time instruction and continuing education are available at the Commonwealth Campuses: Allentown (Fogelsville); Altoona; Beaver (Monaca); Berks (Reading); Delaware County (Media); DuBois; Fayette (Uniontown); Hazleton; McKeesport; Mont Alto; New Kensington; Ogontz (Abington); Schuylkill (Schuylkill Haven); Worthington Scranton (Dunmore); Shenango (Sharon); Wilkes-Barre (Lehman); and York.

PENN STATE GREAT VALLEY—Graduate programs in education, engineering, and management are available at Penn State Great Valley along with an array of continuing education programs.

TWO-YEAR ASSOCIATE DEGREE MAJORS

Majors that lead to two-year associate degrees are available at Penn State-Behrend and all of the University's Commonwealth Campuses except Allentown, as listed previously in this bulletin. These majors provide concentrated instruction to prepare graduates for specialized occupational assignments, except for the Letters, Arts, and Sciences major, which provides graduates with a general education and some specialization in their fields of interest. In addition, a major in Dietetic Food Systems Management is available primarily through the Department of Independent Learning.

More than twenty associate degree majors lead to either the Associate in Arts degree, the Associate in Engineering Technology degree, or the Associate in Science degree. The majors leading to these degrees are listed here.

Associate in Arts Degree

Letters, Arts, and Sciences
Sociology

Associate in Engineering Technology Degree

Architectural Engineering Technology⁺
General Option⁺
Building Environmental Systems Technology
Option⁺
Biomedical Equipment Technology⁺
Computer Engineering Technology⁺
Electrical Engineering Technology⁺
Materials Engineering Technology
Mechanical Engineering Technology⁺
Surveying Technology⁺
Telecommunications Technology⁺

Associate in Science Degree

Agricultural Business
Business Administration
Computer Science
Dietetic Food Systems Management
Forest Technology
Hotel, Restaurant, and Institutional
Management
Human Development and Family Studies
Medical Laboratory Technology
Nursing
Occupational Therapy
Physical Therapist Assistance
Science—General
Science—Radiologic Technologist
Radiographer Option
Wildlife Technology

A description of the purposes, objectives, and content of each two-year major is given in the MAJORS section of this bulletin.

⁺Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC of ABET) at all locations offering the full two years of the program.

ADMISSION

STATEMENT OF BASIC ACADEMIC ADMISSION POLICIES—Admission to University credit courses or degree candidacy at The Pennsylvania State University is governed by policies established by the University Faculty Senate. Although specific applications of these policies may vary from year to year, from location to location, and from program to program, all University admissions are governed by the following general policies:

1. As an institution of higher education, The Pennsylvania State University is committed to making post-high school education available to all who possess a high school diploma or its equivalent without restriction as to age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, or veteran status as provided by law.
2. The primary responsibility of the University is to residents of the Commonwealth of Pennsylvania. Consequently, within limits expressed from time to time by the Board of Trustees of the University, preference shall be given to Pennsylvania residents in the various admissions processes.
3. In order to meet the variety of goals and objectives of the population, the spectrum of offerings is designed to enable persons with a variety of objectives—both degree and nondegree—to receive a higher education. Although access to educational opportunities of the University is open to all, courses offered for credit are available to those holding a high school diploma or its equivalent. Policies governing admission to degree candidacy are established by the University Faculty Senate (with delegation of policies governing admissions to graduate programs to the Graduate Faculty of the University) under a general policy of offering admission to those whose past academic performance indicates a reasonable probability of success.
4. Undergraduate students are admitted to either baccalaureate degree candidacy or associate degree candidacy. To be admitted to degree candidacy, the individual must present an academic performance record that indicates a reasonable probability of his or her success in his or her chosen program. In the case of freshman admission to undergraduate degree candidacy, performance is measured through the high school record and standardized test results. In the case of advanced standing admission, performance is measured either through success in nondegree programs and courses of the University or by success at some other institution of higher education.
5. Within the space available in particular programs and at particular locations, admission shall be offered preferentially to those whose performance record indicates the highest probability of success in the chosen program—with this process continuing until all available spaces are filled. Although exceptions to this policy may be made from time to time (for example, recipients of scholarships with restricting qualifications), these exceptions may be made only for students who meet at least the minimum admission and entrance requirements.
6. If a college or school requires restrictions on its baccalaureate admissions, the priorities or targets established must include provisions to consider qualified students in each of these groups:
Admissions Group I—Freshman Admissions: Students who hold a high school diploma or equivalent, who present fewer than 18 credits of baccalaureate work (from The Pennsylvania State University or another regionally accredited institution), who meet minimum college or school entrance requirements, and who meet minimum college or school admission standards.
Admissions Group II—The Pennsylvania State University Advanced Standing Admissions: Students who (1) request baccalaureate degree readmission, presenting 18 or more credits; (2) request a change from The Pennsylvania State University associate degree to baccalaureate degree status, presenting 18 or more applicable credits; (3) request a change for The Pennsylvania State University provisional degree to baccalaureate degree status, presenting 18 or more applicable credits; or (4) request changes from The Pennsylvania State University nondegree to baccalaureate degree status presenting 18 or more applicable credits. In all advanced standing admissions at The Pennsylvania State University, the student must have a grade-point average of at least 2.00 and must meet the minimum entrance and advanced stand-

ing requirements of the college or school. However, a student who has had an interruption in enrollment at Penn State of no fewer than four calendar years and whose cumulative grade-point average is less than 2.00 may petition for readmission with academic renewal in accordance with Senate Policy 57-00.

Admissions Group III—Other Advanced Standing Admissions: Students who have not been students at Penn State and request baccalaureate degree status at Penn State, presenting 18 or more applicable credits from a regionally accredited institution. In all advanced standing admissions it is understood that the student must have a grade-point average of 2.00 as computed at Penn State and meet the minimum entrance and advanced standing requirements of the college or school. However, a student who has not met the entrance requirements or achieved a grade-point average of 2.00 (on a 4.00 scale) for all graded courses taken at all institutions previously attended, and who has had a four-calendar-year absence from the institution(s), may apply to enroll in credit courses as a provisional student in accordance with Senate Policy 10-00. A student who has had an absence from the institution(s) of fewer than four calendar years, and has not met the entrance requirements or has achieved a grade-point average of less than 2.00, may apply to enroll in credit courses as a nondegree student in accordance with Senate Policy 14-00.

Within these three groups, no special consideration will be given to any group; students will be admitted to the college or school on the basis of academic competition (e.g., SAT scores, grade-point averages, grades in required courses in the college or school, and other evidence predictive of baccalaureate degree performance where available, valid, and reliable).

7. To ensure a proper educational mix of students and to further broaden the educational opportunities offered by the University, the University Faculty Senate and the University administration from time to time may authorize various specialized programs. These programs may permit students who do not meet the basic qualifications for admission to degree candidacy to be admitted to such candidacy. These programs may also permit, in selected situations, exceptional students who have not earned a high school diploma or its equivalent to enroll in University credit courses. Such specialized programs may include up to 10 percent of the total admission group for the University in any one year and up to the maximum of 15 percent of the admission to any geographic location of the University.
8. Within this general policy, the colleges and school of the University, with the concurrence of the University Faculty Senate, may impose certain educational background requirements (Carnegie Units) that must be completed by an individual before being admitted to degree candidacy.

MINIMUM REQUIREMENTS FOR ADMISSION TO DEGREE CANDIDACY—To be eligible for admission consideration to the University as a degree candidate, either as a beginning student or as a student with advanced standing, an applicant must meet the following minimum requirements:

1. Graduation from an accredited secondary school.
2. Completion of the required units of preparatory work as indicated under the heading of Minimum Secondary School Units Required for Admission Consideration in this bulletin.

A secondary school diploma issued by the Pennsylvania Department of Education, or appropriate authority in another state, may be accepted as equivalent to graduation from an accredited secondary school and as equivalent to the minimum secondary school units required for admission, as indicated under the Minimum Secondary School Units Required for Admission Consideration heading, with the exception of mathematics and foreign language.

The University accepts the definition of a secondary school unit as established by the Carnegie Foundation. A unit represents a year of work in a subject in a preparatory school or secondary school, provided that the work done in that subject is approximately one-fourth of the total amount of work regularly required in a year in the school.

The University reserves the right to deny admission to any applicant for any reason the University determines to be material to the applicant's qualifications to pursue higher education.

Admission to degree candidacy is specified in terms of enrollment in a college or school of the University or in the Division of Undergraduate Studies. Both for admission to a college or school

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and for entrance to a major, a student must satisfy the requirements of the University, of the particular college or school, and of the major area. In special circumstances, the University may need to further restrict admission to a college or school and entrance to majors because of space limitations.

MINIMUM SECONDARY SCHOOL UNITS REQUIRED FOR ADMISSION CONSIDERATION FOR ASSOCIATE DEGREE MAJORS

| | English | Math C* | Math D** | Math E*** | Science | Arts/Humanities/ Social Studies/ Foreign Languages |
|--|---------|---------|----------|-----------|---------|--|
| TWO-YEAR DEGREE MAJORS | | | | | | |
| Agricultural Business | 4 | | | 2 | 2 | 5 |
| Architectural Engineering Technology (including General and Building Environmental Systems Technology Options). | 4 | 2 | | | 2 | 5 |
| Biomedical Equipment Technology | 4 | 2 | | | 2 | 5 |
| Business Administration (2-year) | 4 | | 2 | | 2 | 5 |
| Computer Engineering Technology | 4 | 2 | | | 2 | 5 |
| Computer Science (2-year) | 4 | 2 | | | 2 | 5 |
| Dietetic Food Systems Management | 4 | | | 2 | 2 | 5 |
| Electrical Engineering Technology | 4 | 2 | | | 2 | 5 |
| Forest Technology | 4 | | 2 | | 2 | 5 |
| Hotel, Restaurant, and Institutional Management (2-year) | 4 | | | 2 | 2 | 5 |
| Human Development and Family Studies | 4 | | | 2 | 2 | 5 |
| Letters, Arts, and Sciences | 4 | | | 2 | 2 | 5 |
| Materials Engineering Technology | 4 | 2 | | | 2 | 5 |
| Mechanical Engineering Technology | 4 | 2 | | | 2 | 5 |
| Medical Laboratory Technology | 4 | 2 | | | 2+ | 5 |
| Nursing (2-year) | 4 | | 2 | | 2++ | 5 |
| Occupational Therapy | 4 | | | 2 | 2 | 5 |
| Physical Therapist Assistance | 4 | | 2 | | 2+++ | 5 |
| Science (2-year) (including General and Radiologic Technologist Radiographer Options) | 4 | 2 | | | 2 | 5 |
| Sociology (2-year) | 4 | | | 2 | 2 | 5 |
| Surveying Technology | 4 | 2 | | | 2 | 5 |
| Telecommunications Technology | 4 | 2 | | | 2 | 5 |
| Wildlife Technology | 4 | | 2 | | 2 | 5 |

*Math C requirements may be satisfied by at least 2 units of mathematics: 1 unit of algebra and 1 additional unit in any combination of advanced algebra, plane geometry, solid geometry, or trigonometry.

**Math D requirements may be satisfied by at least 2 units of mathematics: 1 unit of algebra and 1 additional unit of mathematics. Plane geometry is recommended for Business Administration, Forest Technology, and Wildlife Technology.

***Math E requirements may be satisfied by any 2 units of mathematics.

+Students entering Medical Laboratory Technology should have 1 unit each in biology and chemistry.

++Students entering Nursing are required to have 1 unit in biology and 1 unit in chemistry.

+++Students entering Physical Therapist Assistance should have 1 unit in biology plus one other science course.

FRESHMAN ADMISSION—An applicant for admission as a beginning student in the freshman class must meet the minimum requirements for admission to degree candidacy as stated above prior to the time of matriculation. All offers of admission are conditional until these requirements have been met.

Each applicant is evaluated on the basis of the high school record and results of the Scholastic Aptitude Test (SAT) or American College Test (ACT). This evaluation produces an evaluation index. Admission decisions are made on the basis of a review of the applicant's evaluation index in relation to the requested area of enrollment (academic program), space availability, and the quality of the credentials presented by other applicants.

When openings at the requested location or in the requested program of the University are filled, qualified applicants will be offered admission to their alternate choice of program or location, or notified of campuses where openings still exist.

College Entrance Tests—All applicants for freshman admission to the University are required to submit scores of the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board or the American College Test (ACT). SAT or ACT results of the junior-year testing periods are recommended. The SAT is preferred.

Changing the Area of Enrollment—An applicant who has been admitted to an associate degree major may not change to another without satisfying entrance requirements of the college and major to which he or she wants to transfer.

Previous Attendance at Another College—An applicant must state on his or her application whether he or she has ever attended any other college or university. Failure to indicate, at the time of application, previous registration at another college or university may result in refusal or cancellation of admission. An applicant who has attempted fewer than 18 semester credits at another regionally accredited college or university will be considered as a freshman applicant. An applicant who has attempted 18 or more credits at another regionally accredited college or university subsequent to high school graduation will be evaluated as an advanced standing applicant.

Obtaining an Application—An application can be obtained from the Undergraduate Admissions Office, The Pennsylvania State University, 201 Shields Building, Box 3000, University Park, PA 16802-1294; (814) 865-5471, or from an admissions officer at any University location.

ADVANCED STANDING ADMISSION—An applicant who has attended any regionally accredited college or institution on the college level and attempted 18 or more semester credits subsequent to high school graduation may be considered for admission with advanced standing. Attendance at any other institution must be reported at the time of application. Failure to indicate, at the time of application, previous registration at another college or university may result in refusal or cancellation of admission.

An applicant for admission with advanced standing must meet the minimum secondary school requirements for admission to degree candidacy as stated above prior to the time of matriculation. Advanced standing applicants are considered for admission on the basis of the applicant's requested academic program, space availability, and the academic quality of their work at the previously attended institution(s). A minimum cumulative average of at least 2.00 (C) out of 4.00, as computed for Penn State students, is required, although certain areas of study may have additional requirements. In addition, an applicant must be in good academic and nonacademic standing. A student who has not met the entrance requirements or achieved a grade-point average of 2.00 (on a 4.00 scale) for all graded courses taken at all institutions previously attended, and who has had a four-calendar-year absence from the institution(s), may apply to enroll in credit courses as a provisional student in accordance with Senate Policy 10-00. A student who has had an absence from the institution(s) of fewer than four calendar years, and who has not met the entrance requirements or has achieved a grade-point average of less than 2.00, may apply to enroll in credit courses as a nondegree student in accordance with Senate Policy 14-00.

Advanced standing credits may be awarded for work taken at regionally accredited institutions provided the grade earned is equivalent to a grade of A, B, or C at this university, and the credits are useful to the student's program of study. An academic adviser determines which of the transferable credits are applicable to the program of study at Penn State. Credits are transferred, but grades and

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grade points are not. Advanced standing students enter the University without an average, and their average begins with the completion of their first semester of study at Penn State.

Associate degree programs have a limit on the number of credits that may be accepted by transfer from regionally accredited institutions. Information about credit limitations may be obtained from the academic official responsible for a particular program.

In certain circumstances, the University may need to restrict advanced standing admissions to particular programs because of space limitations.

Application Procedure—An application can be obtained from the Undergraduate Admissions Office, The Pennsylvania State University, 201 Shields Building, Box 3000, University Park, PA 16804-3000; (814) 865-5471, or from an admissions officer at any University location. In all cases where work has been taken at other institutions, an official transcript from each place of attendance must be submitted directly to the Undergraduate Admissions Office by the registrar of the institution attended. An applicant currently attending another institution also must provide a schedule of courses in progress or to be completed before enrollment at Penn State, including course name, number, description, and number of credits. The Undergraduate Admissions Office may require the student to send a catalog showing the courses that he or she has taken at the college previously attended. The applicant's secondary school record must be submitted directly to the Undergraduate Admissions Office by the school. All credentials become part of the permanent records of the University.

Changing the Major of Enrollment—An applicant who has been admitted to an associate degree major may not change to another without satisfying entrance requirements of the college and major to which he or she wants to transfer.

PROVISIONAL STUDENT (DEGREE-SEEKING)—An applicant seeking to pursue a degree program and holding a high school diploma or its equivalent but without the criteria required for admission as a degree candidate may enroll in credit courses at the University. A provisional student may enroll in credit courses if the following criteria are met:

1. The student is making satisfactory progress toward admission as a degree candidate. Progress is satisfactory if a student has completed 18 credits with a minimum cumulative grade-point average of 2.00 (on a 4.00 scale). If a student has completed 18 credits and earned less than a 2.00 cumulative grade-point average, the student is given a warning. A student who has completed 27 credits with a cumulative grade-point average of less than 2.00 will not be permitted to enroll as a provisional student in any subsequent semester, unless the student earned more than a 2.00 grade-point average in the most recently completed semester. No student, regardless of cumulative grade-point average, who has completed 36 credits will be permitted to enroll as a provisional student in any subsequent semester.
2. There is space available after degree candidates have been accommodated.
3. The student has not been dropped for unsatisfactory scholarship from any college or university previously attended.
4. The student has not been dismissed or suspended for nonacademic reasons from any college or university. An applicant not in good standing at another accredited college or university for disciplinary reasons must consult with the Director of the Office of Judicial Affairs for admissions clearance.

Obtaining an Application—An application can be obtained from the Undergraduate Admissions Office, The Pennsylvania State University, 201 Shields Building, Box 3000, University Park, PA 16804-3000; (814) 865-5471, or from an admissions officer at any University location.

Admission of a Provisional Student as a Degree Candidate—A provisional student may apply for admission as an associate degree candidate after completing 9 credits of Penn State course work with a minimum cumulative grade-point average of 2.00. The applicant also must satisfy the entrance requirements of either the major in which enrollment is desired or of the Division of Undergraduate Studies if the student wishes to enroll in that division. An applicant who has completed at least the equivalent to one year of associate degree work before applying for admission as

an associate degree candidate must have the approval of either the dean of the college or school in which enrollment is requested or of the director of the Division of Undergraduate Studies, if the student wishes to enroll in that division. Under certain circumstances, the University may need to restrict admission to degree candidacy in a particular college, school, or major because of space limitations. Provisional students should work with their advisers and utilize current information about academic requirements and restrictions in planning their programs of study toward admission to degree candidacy. After a student is admitted as a degree candidate, the dean of the college or school of enrollment decides which credits earned as a provisional student may be used to fulfill the degree requirements.

NONDEGREE STUDENT—Any person having received a high school diploma or its equivalent may be permitted to enroll in credit courses (either for credit or audit) at the University. Some of these persons will be classified as nondegree students.

A nondegree student who has not been dropped from degree or provisional status by Penn State or any other college or university for unsatisfactory scholarship will be listed as a nondegree-regular student and may enroll in any number of credits not to exceed the typical credit load of a full-time student per semester if criteria 1, 2, and 3 (on the following list) are met.

A nondegree student who has been dropped from degree or provisional status by Penn State or any other college or university because of unsatisfactory scholarship will be listed as a nondegree-conditional student and may enroll in a maximum of 10 credits per semester if criteria 1, 2, 3, and 4 (on the following list) are met.

1. The student has completed the prerequisite for the courses to be scheduled or has obtained permission from the instructor to schedule the course.
2. Space is available after degree candidates and provisional students have been accommodated.
3. The student has not been dismissed or suspended for nonacademic reasons from any college or university. An applicant not in good standing at another college or university for disciplinary reasons must consult with the director of Judicial Affairs for admission clearance.
4. The student has obtained academic advising/counseling from an adviser/counselor designated by the academic unit to which admission, or reinstatement and readmission, is desired.

Note: A student must be admitted, or reinstated and readmitted, as a degree candidate to apply the credits earned as a nondegree student toward fulfilling the requirements for a degree. The dean of the college or school of enrollment shall decide which credits may be used to fulfill the degree requirements.

Obtaining an Application—An application can be obtained from the Undergraduate Admissions Office, The Pennsylvania State University, 201 Shields Building, Box 3000, University Park, PA 16804-3000; (814) 865-5471, or from an admissions officer at any University location.

Admission of Nondegree Student as a Degree Candidate—A nondegree student may apply for admission as an associate degree candidate upon completion of at least 9 credits earned at Penn State with at least a 2.00 cumulative grade-point average. An applicant who has completed at least the equivalent of one year of associate degree work before applying for admission as an associate degree candidate must have the approval of the dean of the college or school in which enrollment is requested. To be eligible for degree admission, the nondegree student must meet the academic requirements of the University and the college or school in effect at the time of application. Under certain circumstances, the University may need to restrict admissions to degree candidacy or entrance to particular majors because of space limitations. After a student is admitted as a degree candidate, the dean of the college or school of enrollment decides which credits earned as a nondegree student may be used to fulfill degree requirements.

ACADEMIC ASSISTANCE

The Basic Skills Program, a part of the University's Academic Assistance Programs, consists of both academic services and courses designed to accommodate differences between high school preparation and the minimum college-level skills necessary for success in introductory University courses. The primary goal of this program is to provide academic support in writing, reading, mathematics, and other essential learning processes. Students may be identified for basic skills assistance via FTCAP placement scores or referral (self-, instructor, adviser, etc.).

Students with weaknesses in English composition are required to enroll in English 004 (3 credits) prior to scheduling English 015 (GWS;DEX). English 004 provides intensive practice in expository writing with instruction in the basic conventions of syntax and mechanics. A 1-credit tutorial, English 005, may be taken concurrently with English 004. Credits earned in English 004 and 005 do not substitute for minimum program requirements designated under the categories of "General Education," "Requirements for the Major," or "Electives."

Students with mathematics weaknesses are encouraged to strengthen these skills by reviewing the following topics: operations with rational numbers and decimals; applications involving ratio, proportion, and percent; factoring algebraic expressions; operations with polynomials; properties of exponents; solutions of linear equations and inequalities; operations with radical expressions; solution of quadratic equations and inequalities; graphing in the coordinate plane; and solutions of systems of equations. Credited courses are available to assist in the review of the topics. The credits earned in these courses may not be used for minimum program requirements for "General Education," "Requirements for the Major," or "Electives."

Assistance in reading is available through a series of college reading improvements courses. LL ED 005 focuses on the development of basic reading skills and their efficient application to college study. LL ED 010 involves incorporation of higher-level vocabulary, comprehension, and study skills in content area courses. Each course is offered for 3 credits and may be used to fulfill elective credits if program requirements in this category are not restricted by program, department, or college policy.

The Learning Center, a resource available at most campus locations, offers a variety of services. This facility and its resources are open to any student who needs or wants assistance in the basic skill areas of writing, reading, and mathematics. Other Learning Center services may include study skills development, subject area tutoring, supplemental instruction, and computer-assisted learning.

ASSOCIATE AND BACCALAUREATE DEGREES

The associate degree majors outlined in this bulletin lead to the following degrees: Associate in Arts, Associate in Engineering Technology, and Associate in Science.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT THE UNIVERSITY PARK CAMPUS—Credits received for associate degree program courses may be applicable to a particular baccalaureate degree program listed in the current Penn State *Baccalaureate Degree Programs Bulletin* at the discretion of the appropriate college and major department.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT PENN STATE ERIE, THE BEHREND COLLEGE—Graduates of associate degree majors may also qualify for admission to a variety of baccalaureate degree majors at Penn State-Behrend. Students interested in applying to Penn State-Behrend should contact that college's Admissions Office or talk with the Penn State-Behrend representative at their campus.

Graduates of associate degree majors in either Business Administration or Computer Science may want to continue study in one of the following baccalaureate degree majors at Penn State-Behrend: Accounting; Business Economics; Business, the Liberal Arts, and Science; Management; or Management Information Systems. Students graduating with a two-year degree in Letters, Arts, and Sciences may want to consider any of a large number of majors offered by Penn State-Behrend in the liberal arts, sciences, and business.

Graduates of associate degree majors in Biomedical Equipment Technology, Electrical Engineering Technology, Computer Engineering Technology, and Telecommunications Technology

may want to continue their education in the baccalaureate degree major in Electrical Engineering Technology. Students receiving an Associate in Engineering Technology degree in Mechanical Engineering Technology or Architectural Engineering Technology (including General and Building Environmental Systems Technology options) may want to continue study in a baccalaureate degree major in either Mechanical or Plastics Engineering Technology.

APPLICATION OF ASSOCIATE DEGREE CREDITS TOWARD A BACCALAUREATE DEGREE AT PENN STATE HARRISBURG—In addition to receiving an education to prepare for employment, the graduate of an associate degree program may also qualify for admission to various programs leading to a baccalaureate degree from Penn State Harrisburg. Those anticipating admission to Penn State Harrisburg should inquire at that college's admissions office late in their freshman year or early in their sophomore year concerning baccalaureate degree course requirements.

Graduates from associate degree programs in Business Administration or Computer Science may want to consider further study at Penn State Harrisburg in a Business Administration baccalaureate degree program.

Graduates of the associate degree majors in Architectural Engineering Technology, Biomedical Equipment Technology, Electrical Engineering Technology, Materials Engineering Technology, Mechanical Engineering Technology, Surveying Technology, and Telecommunications Technology may want to consider continuing at Penn State Harrisburg in an engineering technology major leading to a bachelor of science degree in engineering technology. Majors are offered in Electrical Engineering Technology, Computer Engineering Technology, Environmental Engineering Technology, Mechanical Engineering Technology, and Structural Design and Construction Engineering Technology.

Associate degrees in the following majors are also acceptable toward admission to baccalaureate degree majors at Penn State Harrisburg: Forest Technology; Hotel, Restaurant, and Institutional Management; Letters, Arts, and Sciences; Medical Laboratory Technology; Computer Engineering Technology; and Sociology. Penn State Harrisburg programs related to these majors are offered by the college's Division of Humanities, Division of Behavioral Science and Education, and Division of Public Affairs.

Graduates of the associate degree majors in Science and in Computer Science may want to consider admission to the baccalaureate degree major in Mathematical Sciences at Penn State Harrisburg.

BACCALAUREATE DEGREE PROGRAMS—Graduates of associate degree majors also may qualify for admission to one of the baccalaureate degree programs offered at the following Penn State campuses: B.A. or B.S. in Administration of Justice at Fayette and Ogontz Campuses; B.S. in Electrical Engineering Technology at Berks, New Kensington, and Wilkes-Barre Campuses; B.S. in Mechanical Engineering Technology at Berks and New Kensington Campuses; B.A. in General Arts and Sciences at Altoona, Beaver, Delaware County, DuBois, Fayette, Hazleton, Mont Alto, McKeesport, Ogontz, and Schuylkill Campuses; and B.S. in Nursing at Shenango and New Kensington Campuses. For more information, contact the admissions office at the campus offering the program.

DIVISION OF UNDERGRADUATE STUDIES (DUS)

The Division of Undergraduate Studies is an academic unit of the University that offers at the Commonwealth Campuses; Penn State Erie, The Behrend College; and University Park Campus the following programs and services:

Freshman Testing, Counseling and Advising Program (FTCAP)—New first-year students admitted to the University are provided with comprehensive testing, educational planning, and academic advising prior to attending first-semester classes. The purpose of the program is to provide all new students with assistance in evaluating their educational plans and objectives.

Enrollment Program—New first-year students who prefer to test their abilities and interests or who want to explore several areas of study before identifying themselves with one of the University's colleges may request to begin their enrollment in the Division of Undergraduate Studies. Other students who are enrolled in the University but who experience changes in interests or educational objectives, who discover new opportunities, or who want to gain a better perspective of their abilities may also seek enrollment in the division to facilitate a change to a new program of study.

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Academic Advising Program—All students, whether or not they are enrolled in the Division of Undergraduate Studies, have available to them the professional advising, educational planning, and referral services provided by DUS. Such services are a supplement to and are coordinated with the advisory services of the colleges and other degree-granting units and faculty. Provisional students aspiring to degree programs are also served by this unit.

Academic Information Program—The Division of Undergraduate Studies provides a comprehensive academic information support system throughout the University to assist faculty in their student advisory responsibilities. Academic advising and information centers are located at each of the campuses in the Commonwealth Educational System and in the colleges and other degree-granting units of the University.

GRADING SYSTEM

The grades of A, B, C, D, and F indicate the following qualities of academic performance:

- A (EXCELLENT) Indicates exceptional achievement.
- B (GOOD) Indicates extensive achievement.
- C (SATISFACTORY) Indicates acceptable achievement.
- D (POOR) Indicates only minimal achievement. It indicates that the student may be seriously handicapped in carrying a more advanced course for which this course is a specific prerequisite.
- F (FAILURE) Indicates inadequate achievement necessitating a repetition of the course in order to secure credit.

The grades of A, A-, B+, B, B-, C+, C, D, and F indicate a gradation in quality from Excellent to Failure and are assigned the following grade-point equivalents:

| <i>Grade</i> | <i>Grade-Point Equivalent</i> |
|--------------|-------------------------------|
| A | 4.00 |
| A- | 3.67 |
| B+ | 3.33 |
| B | 3.00 |
| B- | 2.67 |
| C+ | 2.33 |
| C | 2.00 |
| D | 1.00 |
| F | 0 |

Grade points are determined by multiplying the grade-point equivalent of the grade earned by the number of credits for the subject; e.g., ENGL 015 (GWS;DEX), 3 credits, with a grade of A (grade-point equivalent 4.00) yields 12 grade points.

GRADUATION REQUIREMENTS—In order to graduate, a student must (1) complete the course requirements of the major and earn at least a C average (a grade-point average of 2.00) for all courses and (2) earn at least a C grade in each major course designated by the major as a C-required course.

INFORMATION FOR NEW STUDENTS

The Office of Undergraduate Information and Communications provides freshmen as well as advanced standing and change-of-assignment students at University Park Campus with comprehensive information regarding the essential academic and student development opportunities of the campus and the University in general beginning with a new student's acceptance to a campus and continuing through completion of the new student's first semester.

Through programs offered in cooperation with the colleges' academic units and various student service operations, new students are introduced to the intellectual and scholarly expectations of the University, to the skills needed for advanced study and lifelong learning, and to the student development opportunities with academic merit. In addition, this office provides a series of communications

designed to introduce the University, to inform students of the required procedures for matriculation, and to offer a perspective on college life. These communications also give new students practical information about important dates, times, and locations (e.g., arrival day, first day of classes, course drop/add, etc.).

Many programs for new students are scheduled during arrival week each semester. During this period, new students receive instruction and counseling concerning their courses of study and participate in extracurricular and cultural activities. Registration and class schedule adjustment opportunities also are available during arrival week.

STUDENT WELFARE

CAREER DEVELOPMENT AND PLACEMENT SERVICES—Career Development and Placement Services assists students in continual evaluation of their educational and career plans as they progress through college and helps them identify personal or academic qualities that may enhance effective career decision making. Individual as well as group educational and career counseling programs are available to students. Computerized guidance systems, DISCOVER or SIGI-PLUS, are available for student use at each campus location.

A Student Affairs staff member at each campus is responsible for providing placement assistance for associate degree graduates. Services include inviting employers to the campus to interview graduates for permanent employment, providing job information, and assisting students in preparing for the job search process. Career Development and Placement Services at the University Park Campus supplies prospective employers (national, state, and local) with information concerning the associate degree programs and works cooperatively with the Commonwealth Campuses in assisting graduates to locate suitable employment.

DISABILITY SERVICES—Penn State encourages academically qualified students with disabilities to take advantage of its educational programs. It is the policy of the University not to discriminate against persons with disabilities in its admission policies or procedures or its educational programs, services, and activities.

The University is responsible for making all of its programs and services available to all its students. In cases where it is necessary to provide auxiliary services and programs to meet the specific needs of students with disabilities, it is the responsibility of the director of the Office for Disability Services to make reasonable accommodations. Examples of such accommodations are sign language interpreters, accessible University transportation, and classroom and library assistance. Students anticipating the need for accommodations, both before and after enrollment, are encouraged to contact the director of the Office for Disability Services at University Park Campus (105 Boucke Building) or the director of student affairs at other campuses.

HEALTH SERVICES—University Health Services assists in promoting and maintaining the health of students.

Prior to their initial registration, all new full-time students entering the University must submit a health history on a special form provided by the University. The completed form constitutes a vital part of the student's medical record.

The health services of the University are made available to students in accordance with a statement provided by each campus, pertinent to that campus, and published in its student handbook.

The University does not obligate itself for payment of medical services other than those provided by personnel employed or retained by the University and in facilities owned or contracted for by the University. Treatment provided in contract facilities must be authorized by the campus executive officer, the director of student affairs, or the nurse.

INSURANCE PROTECTION WHILE ATTENDING THE UNIVERSITY—Any student who wants insurance protection while in attendance at the University (1) against personal injury or liability, and/or (2) against loss of property by fire or theft must arrange personally for whatever insurance is desired.

Penn State has negotiated an accident and sickness insurance policy with a variety of benefits available to all students at the University and administered through University Health Services, University Park Campus.

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Newly enrolled international students and their dependents are required to have health insurance that meets criteria established by the University Student Insurance Committee. New international students must show proof of insurance to the Student Insurance Office at the University Park Campus. For further information about health insurance, please contact the Student Insurance Office at (814) 865-7467.

STUDENT CONDUCT—The Code of Conduct prohibits acts that interfere with the basic purposes or processes of the University, or with the rights, health, and safety of its members. Such acts include, but are not limited to, academic dishonesty, unethical and destructive behavior, and violation of rules and regulations. Violations of the code are subject to disciplinary action that may include separation from the University. Students, faculty, or staff may file complaints regarding student violations of the Code of Conduct with Judicial Affairs at any University location.

STUDENT GOVERNMENT—Representative student leadership is provided on each campus of the University by a student government association that functions through officers and representatives elected from and by the student body. In addition to involvement in student programs at their local campuses, student officers and delegates from University campuses convene several times annually. These meetings provide for an exchange of information among the various student government associations and for systemwide coordination in student government and student activities.

STUDENT AID

In addition to the student aid information provided below, students may want to consult the admissions booklets sent to all applicants and the *An Overview of Costs and Student Aid at Penn State* brochure, available upon request. Additional questions should be directed to the Office of Student Aid, 314 Shields Building, on the University Park Campus, or to the student aid representative at other Penn State campuses.

AID PROGRAMS AVAILABLE TO ASSOCIATE DEGREE CANDIDATES

GRANTS (aid sources not requiring repayment)

Federal Pell Grant—The Federal Pell Grant is the major grant program available to undergraduates. This award is available to undergraduates pursuing an associate degree.

Pennsylvania Higher Education Assistance Agency (PHEAA) Grant—This is a grant offered by the Commonwealth of Pennsylvania to assist undergraduates who have a financial need as defined by PHEAA guidelines. Applicants must be residents of Pennsylvania and enrolled full-time.

NOTE: Non-Pennsylvania residents should contact their home state higher education assistance agencies for information on state grants available for attending Penn State. Names and addresses of higher education assistance agencies are available from the Office of Student Aid at University Park Campus or the student aid representative at any other Penn State campuses.

Federal Supplemental Educational Opportunity Grant (SEOG)—This grant is available to undergraduates with high financial need. It normally is awarded in combination with the Federal Work-Study Program and/or the Federal Perkins Loan. Priority is given to students who appear eligible for the Federal Pell Grant.

Penn State Academic Grant—This grant is awarded to students demonstrating academic excellence and high financial need.

LOANS

Federal Stafford Loan—The Federal Stafford Loan is a subsidized loan program of the Department of Education, available through banks, savings and loan associations, credit unions and other private lenders. It offers students (attending on at least a half-time basis) the opportunity to borrow money

for their education. The current interest rate is 6.22 percent (set annually). Repayment begins six months after a student ceases enrollment. First year undergraduate students can borrow up to \$2,625; second-year, \$3,500; third-year, \$4,500; fourth- and fifth-year, \$5,500. The maximum borrowing limit is \$23,000 for undergraduate studies.

Federal Unsubsidized Stafford Loan—This is a loan program of the Department of Education, available through banks, savings and loan associations, credit unions and other private lenders. This loan is available to students who demonstrate limited or no eligibility for the Federal Stafford Loan and requires a payment of the accruing interest while the student is enrolled. Terms and conditions for this loan, including borrowing limits, are consistent with those of the Federal Stafford Loan program.

Federal PLUS/SLS Loan—Parent Loan for Undergraduate Students (PLUS) is an educational loan available to parents of dependent students (both undergraduate and graduate). Similar to Federal Stafford Loans, funds are borrowed from banks and private lenders. The current interest rate on this loan is 6.61 percent (set annually) and repayment of the loan begins sixty days after a promissory note is signed. Parents may borrow up to the student's cost of attendance (minus other aid). The program currently has no borrowing limits.

Supplemental Loans for Students (SLS) is an educational loan program available for independent students who require funds in excess of Federal Stafford Loan funds (subsidized and unsubsidized). Funds are borrowed from banks and private lenders. The current interest rate on this loan is 6.61 percent (set annually) and repayment of the loan begins sixty days after a promissory note is signed. First and second-year students can borrow up to \$4,000 per year. All other undergraduates can borrow up to \$5,000 per year. The maximum borrowing limit is \$23,000 for undergraduate studies.

Federal Perkins Loan—This program provides loans of up to \$1,000 per year for students who demonstrate financial need. The career maximum borrowing limit for undergraduate students is \$9,000. The interest rate on this loan is 5 percent and repayment begins nine months after a student ceases enrollment. Postponement of repayment or cancellation of the loan may be arranged under certain conditions following graduation.

University Loans—University Loans are funds established to help students with financial need. Funds are available, in limited amounts, to students nearing the end of their academic career and experiencing unique circumstances. Repayment of this 6 percent interest loan begins six months after the student ceases enrollment.

NOTE: First-time, freshman borrowers of Federal Stafford Loan (subsidized and unsubsidized) and SLS Loan funds must wait 30 days after the beginning of the semester before funds can be disbursed. Also, all first-time Penn State students (graduate and undergraduate) borrowing in the Federal Stafford Loan (subsidized and unsubsidized) and SLS Loan Program must participate in "Entrance Counseling" concerning loan obligations before any funds can be disbursed.

EMPLOYMENT

Federal Work-Study Program (FWSP)—The Federal Work-Study Program is a form of aid that allows students to earn a portion of their documented financial need through an approved FWSP position. This is a non-repayable source of aid since the student is paid an hourly wage for his or her employment.

Student Employment—Students who are interested in part-time employment on campus or in their local area should contact their campus Employment Office.

SCHOLARSHIPS

University Scholarships—University scholarships are awarded on the basis of superior high school or college academic performance and, in most cases, documented financial need. They are awarded either by the scholarship committees in the various Penn State academic colleges, by the Freshman or Faculty Senate Scholarship Committee, or by Commonwealth Campus scholarship committees.

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HOW TO APPLY

ALL students (graduate and undergraduate) must complete a *Free Application for Federal Student Aid*. Non-Pennsylvania residents should check with their home state grant agencies to determine if additional forms must be completed. Applications are available from high school guidance counselors, the Office of Student Aid, 314 Shields Building, University Park, PA, 16802-1220; or the student aid representative at other Penn State Campuses. The recommended filing date for all applications is as soon after January 1 as possible but not later than February 15 of each year. The applications allow students to be considered for: State Grants, Federal Pell Grant, Federal SEOG, Federal Perkins Loan, Federal Work-Study, Penn State Academic Grant, Federal Stafford Loan (subsidized and unsubsidized), Federal PLUS/SLS Loans, University Loans, and University Scholarships.

Freshman students are automatically considered for all available University scholarships (academic colleges may require a separate application). Returning and transfer students must file a separate University Scholarship Application, available at the Office of Student Aid at University Park Campus or through the student aid representative at other Penn State campus. Separate applications, available from lenders, are also required for consideration for Federal Stafford Loan and Federal PLUS/SLS Loan funds.

HOW MUCH DOES IT COST TO ATTEND PENN STATE?

One of the major concerns of students and their parents is knowing how much it will cost to attend Penn State for an academic year. The following itemized list of expenses, although prepared for the 1993-94 academic year, may be used as a basic guide for planning. Students may find that some of the costs vary according to individual needs and circumstances.

STUDENT BUDGET—1993-94

| | <i>Residence Halls or Off-Campus Housing</i> | <i>Living at Home</i> |
|---|--|-------------------------------|
| Tuition and Fees | \$4,752* | \$4,752* |
| Room & Board | 3,930 | 1,500 |
| Books & Supplies | 490 | 490 |
| Clothing & Laundry, Transportation, Personal Maintenance, Medical, & Recreation | 2,378 | 2,838 |
| Total* | \$11,620 | \$9,560 |

*For Pennsylvania residents, 1993-94 undergraduate tuition and charges at Commonwealth Campuses is \$4,602.

Penn State has established an enrollment incentive to encourage more out-of-state students to take advantage of the educational opportunities available at the Commonwealth Campuses. Beginning in the 1994-95 academic year, nonresident tuition at the Commonwealth Campuses will be approximately one-and-one-half times the resident rate. This rate is currently estimated at \$7,413. The total estimated budget for a non-Pennsylvania undergraduate at a Commonwealth Campus is \$14,211.

For non-Pennsylvania residents at University Park Campus, Penn State-Behrend, and Penn State Harrisburg, the nonresident undergraduate tuition and charges figure of \$10,170 should be substituted. The estimated budget for non-Pennsylvania undergraduates at these locations is \$16,210.

STUDENT AID POLICIES

The Office of Student Aid at Penn State administers and coordinates the aid programs according to applicable federal and state regulations and University policies that guarantee each student equal access to financial assistance. The Office of Student Aid employs the standard need analysis services of the Pennsylvania Higher Education Assistance Agency, a licensed agent of the Department of Education, to assess the aid eligibility of student applicants, ensuring equity of treatment among all applicants.

Eligibility for aid is contingent upon the student's financial need for assistance to meet educational costs. Each program has specific eligibility requirements that must be met before funds are awarded. In addition to financial need as a criterion for receiving aid, a student must be enrolled as

a degree or provisional student. Nondegree students are not eligible to receive aid at Penn State. The University may require an official copy of the Federal Income Tax Form 1040 to verify eligibility for aid.

The Office of Student Aid assumes that all aid applicants will keep apprised of all application deadlines pertaining to the aid sources they are seeking. Because limited funds are available, applications filed after the applicable deadline dates are considered only as funds permit. On-time applicants receive first consideration. Some aid programs have flexible application deadlines that permit students to receive consideration at most times during the year (for example, the Federal Pell Grant and Federal Stafford Loan programs). Current and prospective aid recipients are strongly encouraged to keep well informed of aid application procedures through aid publications, news media, and agencies providing aid information such as the Office of Student Aid at University Park Campus and the student aid representative at other Penn State campuses.

Aid is never automatically awarded for subsequent years. Students must reapply each year for funds. Students who plan to attend during summer session must file former-year as well as current-year applications to be considered for all aid programs. The Federal Pell Grant program has no separate summer application and is generally awarded to students during the fall/spring academic year. Federal Pell Grant recipients not attending the entire fall/spring year should contact the Office of Student Aid to determine if a summer payment is possible.

One of the goals of the Office of Student Aid is to help student aid recipients receive a student aid package that will attempt to meet the student's documented financial need. The student aid package can be composed of federal aid, state grant monies, private award sources, or any other source of funds available to the student.

It is the responsibility of the Office of Student Aid, however, to assure the federal government that federal aid recipients will not be permitted to retain financial aid *exceeding* their financial need. Students should be aware that if the aid received is in excess of financial need, they will be notified of their responsibility to return the excess amount to the University.

FEDERAL STUDENT ASSISTANCE SATISFACTORY ACADEMIC PROGRESS STANDARD

Satisfactory academic progress must be maintained for continued consideration for federal financial assistance at Penn State. Students must comply with the following to ensure continued consideration:

1. Academic progress is determined during an annual review each spring. The review determines student aid eligibility for the next enrollment period (summer session and/or the following academic year).
2. Undergraduate students registering full-time must complete a minimum of 24 credits (based on full-time enrollment) in their first year to maintain satisfactory academic progress. Upperclass students can maintain satisfactory academic progress by continuing to successfully complete the minimum credits required.
3. The minimum credit requirement is determined in proportion to the number of credits registered. For example, three-quarter-time students will be required to progress at 3/4 the minimum standard.
4. Students who drop credits, withdraw from a semester, unsuccessfully complete credits, enroll in audit or repeat courses, etc., may fall below the minimum requirement for satisfactory progress.
5. A probation period is granted to undergraduate students who fall below the minimum credit requirement, but within the probation standard. Students on probation remain eligible for aid. The probation period lasts one academic year, after which the minimum credit requirement must be satisfied for future student aid eligibility.
6. Undergraduate students who are more than 10 credits deficient of the minimum credit requirement are determined to be making unsatisfactory progress and are not eligible for student aid.
7. Students falling to unsatisfactory progress, but returning to satisfactory progress through completion of summer session or fall semester credits, may be considered for student aid during the remainder of the academic year, on a funds-available basis.
8. Requirements for the associate degree must be completed within six semesters.

GENERAL INFORMATION

Exceptions to the above and information concerning reinstatement of aid can be obtained by contacting the Office of Student Aid, The Pennsylvania State University, 314 Shields Building, University Park, PA 16802-1220. Copies of the Federal Student Assistance Satisfactory Academic Progress Standard are available from the Office of Student Aid at University Park Campus or the Office of Student Affairs at other Penn State campuses.

SELECTIVE SERVICE REGISTRATION COMPLIANCE

Educational institutions are now required by law to collect a Statement of Registration Compliance from every federal student aid recipient whether male or female. This attests to their status with the Selective Service. Disbursement of federal student aid funds cannot occur until the Statement of Registration Compliance is on file with the Office of Student Aid. This requirement applies to Federal Perkins Loan (NDSL); Federal SEOG; FWSP, Federal Pell, Federal Stafford Loan, and Federal PLUS/SLS programs.

DEFAULT STATEMENT

Educational institutions also are required by law to collect a Default Statement from every federal student aid recipient. This certifies that the student is not in default on any loan made under the Federal Stafford Loan, Federal PLUS/SLS, Consolidation, Income Contingent, or Federal Perkins Loan (NDSL) programs and that he/she does not owe a refund on a grant received under the Federal Pell Grant, Federal SEOG, SSIG, or Byrd Scholarship programs. Disbursement of federal aid funds cannot occur until the Default Statement is on file with the Office of Student Aid. This requirement applies to the Federal Perkins Loan (NDSL), Federal SEOG, FWSP, Federal Pell, Federal Stafford Loan, and Federal PLUS/SLS programs.

ESTIMATED TUITION, ROOM, BOARD, AND OTHER CHARGES

Note: The University reserves the right to revise tuition, room, board, and other charges without further notice. Tuition and charges for baccalaureate and graduate programs are listed separately in the *Baccalaureate Degree Programs*, *Graduate Degree Programs*, and *Penn State Harrisburg Bulletins*. Penn State has two semesters and a summer session. Students normally attend two semesters per year. The tuition and charges set forth below are for the 1993-94 academic year. The actual tuition and charges for the 1994-95 academic year will be established prior to the beginning of the fall semester of the academic year.

TUITION—Tuition per semester for associate degree students in 1993-94:

| | <i>Pennsylvanians</i> | <i>Non-Pennsylvanians*</i> |
|---|-----------------------|----------------------------|
| 12 or more credits: | | |
| University Park Campus, Penn State-Behrend, | | |
| Penn State Harrisburg | \$2,376 | \$5,050 |
| Commonwealth Campuses | 2,301 | 5,050 |
| 11 or fewer credits: | | |
| University Park Campus, Penn State-Behrend, | | |
| Penn State Harrisburg—rate per credit | \$199 | \$422 |
| Commonwealth Campuses—rate per credit | 185 | 422 |

*See footnote on page 28 for information about proposed tuition changes for non-Pennsylvanians.

Enrollment Charge—All entering students who plan to enroll for 12 or more credits are required to pay a nonrefundable enrollment charge of \$75 upon acceptance of an offer of admission.

General Deposit—Undergraduate students are required to make a general deposit of \$50 at the time of admission. This deposit will serve to safeguard the property and equipment used by students in their course of study. It will be retained until a student withdraws or is graduated.

The deposit, less any charges for equipment damages, losses, and forfeitures, will be refunded early in the subsequent semester to the student who has withdrawn or been graduated. The refund will be made by check and mailed to the student's home address.

TUITION, ROOM, BOARD, AND OTHER CHARGES

Credit by Examination—A charge of \$30 per credit is made for credit by examination. For evaluation of credits completed elsewhere, a charge of \$35 is made for those applying for admission and a charge of \$3 for those who are already matriculated.

Student Activities—Student activities charges are determined by elected representatives of the student body, together with a faculty representative.

Certification and Verification Fee—A charge of \$4 is made for each request for verification or certification of enrollment.

Change of Schedule Charge—Unless a change is necessitated by the University, a charge of \$6 per day is made for each change of schedule after the first five working days of a semester.

Late Registration Charge—Unless the delay is unavoidable, \$10 is charged a student who fails to register on the appointed day.

Other Expenses—Books and supplies must be secured by the student. These vary, starting at approximately \$200 per semester, depending upon the program.

TERMS OF PAYMENT—Tuition and charges, including room and board, are due and payable in advance of each semester at the Office of the Bursar, The Pennsylvania State University, 103 Shields Building, University Park, PA 16802-1282. Registration for courses is not complete until a semester bill is processed.

Approximately six weeks in advance of each semester, the University will mail to each continuing and newly admitted degree student of record a semester bill for tuition and, where applicable, residence hall charges. Payment by mail is encouraged before the established deadline. The receipt is returned to the student by mail. If checks tendered for payment of tuition and charges are not paid upon presentation to the maker's bank, the student will automatically incur the late payment fee of \$25, and the receipt previously mailed will be considered null and void.

Any student who does not fulfill payment of obligations by the deadline established may be charged the late payment fee of \$25. This charge for late payment also applies to unpaid student supplemental charges. Students whose accounts are delinquent for more than ten days are subject to suspension from the University.

The University reserves the right to withhold transcripts and services to any current or former student who has an unsatisfied financial obligation to the University.

COMPUTER FEE—The fee is a nonrefundable general University fee chargeable to *all* students, regardless of whether they are on campus or off campus (e.g., student teaching, Co-op assignment, etc.). The only exceptions are summer session students and students registering in 601 through 611 courses.

A student's scheduled courses as of the first day of the semester determine the fee according to the following schedule:

| | |
|-----------------------------|------|
| 4 credits or less | \$12 |
| 5–8 credits | \$25 |
| 9 or more credits | \$35 |

If credits are added, the fee could increase; however, the fee *will not* be reduced if credits are dropped.

SURCHARGE—The fee is nonrefundable and is in addition to tuition charges for all College of Earth and Mineral Sciences, College of Engineering, and Departments of Architecture and Landscape Architecture students in the fifth semester or higher, whether they are on campus or off campus (e.g., Co-op assignment, Education Abroad, multiple campus registration, etc.). The only exceptions are summer session students and students registering in 601 through 611 courses.

A student's scheduled courses as of the first day of the semester determine the fee according to the following schedule:

| | |
|-----------------------------|-------|
| 4 credits or less | \$60 |
| 5–8 credits | \$120 |
| 9 or more credits | \$200 |

If credits are added, the fee could increase; however, the fee *will not* be reduced if credits are dropped.

TUITION ADJUSTMENT POLICY

WITHDRAWAL—Charges for tuition, room, and board are adjusted upon withdrawal from the University only in the event the student obtains an Official Withdrawal Form at the office of the dean of his or her college or other degree-granting unit and presents it at the Office of the Registrar. Adjustments of tuition are based upon the date of last class attended provided the Official Withdrawal Form is presented within one calendar month of that date, otherwise the adjustment will be based on the date the Official Withdrawal Form is presented at the appropriate office. Adjustments of room and board are based upon the date belongings are removed and the room key and meal ticket are returned, or the effective date of the withdrawal from classes, whichever is later. Students, both full-time and part-time, who meet these conditions are entitled to receive adjustments of tuition, room, and board in accordance with the following schedule:

Adjustment of 80 percent upon withdrawal before the end of the first week of the semester (seventh consecutive calendar day from the first day of classes) and a decrease of 10 percent for each week thereafter up to and including the eighth consecutive calendar week. No adjustment for withdrawal will be made after the eighth consecutive calendar week of the semester.

ADJUSTMENT OF CHARGES FOR TUITION, COURSES LESS THAN FIFTEEN WEEKS (SEMESTER)

| <i>Duration of Course</i> | <i>Tuition-Adjustment Percentage</i> |
|---------------------------|---|
| 1 week or less | 0 |
| 2–3 weeks | first week 50; second week 0 |
| 4–5 weeks | first week 70; second week 40; third week 0 |
| 6 weeks | first week 70; second week 40; third week 20; fourth week 0 |
| 7–10 weeks | first week 80; second week 60; third week 40; fourth week 20; fifth week 0 |
| 11 weeks or more | 80 percent first week and a decrease of 10 percent for each week thereafter up to and including the eighth consecutive calendar week. |

POLICY FOR STUDENTS ENROLLED FOR 12 OR FEWER CREDITS—If a student is enrolled for 12 or fewer credits and drops 1 or more credits, adjustments will be determined on the effective date of the drop using the same adjustment percentage as listed above under withdrawal.

TERMS OF ADJUSTMENT—The University will not release refunds of tuition, room, and board until at least three weeks have elapsed from the date the payment was received. All refunds will be made by check and mailed to the student's home address. No refunds will be made for other charges.

Requests for refunds based on withdrawal from the University should be addressed to the Office of the Bursar, The Pennsylvania State University, 103 Shields Building, University Park, PA 16802-1282.

Deposits or deposit balances and credit balances on student accounts will be refunded to the student early in the semester following the student's withdrawal or graduation. The refund will be made by check and mailed to the student's home address that is currently on file with the University. All financial obligations of every kind, whether matured or unmatured, due and owing to the University must be completely settled before any refund is issued.

If, due to incorrect student address information, the University's attempt to forward a refund fails, the University will retain the deposit and/or the student account credit balance for one year. After one year, the refund amount will become a general gift to the University.

DELINQUENT ACCOUNTS—Any charge incurred in collecting a delinquent account will be added to the account. This applies, but is not limited to, charges by an attorney or collection agency.

RESIDENCY CLASSIFICATION FOR TUITION PURPOSES

PENNSYLVANIA CLASSIFICATION

A student shall be classified as a Pennsylvania resident for tuition purposes if that student has a Pennsylvania domicile. A domicile is a person's existing and intended fixed, permanent and princi-

pal place of residence. A student whose presence in the Commonwealth is primarily for *educational purposes* shall be presumed to be a non-Pennsylvania resident for tuition purposes. The following are considerations that may be used by the University in determining whether a student is a resident for tuition purposes:

1. A student under the age of 21 is presumed to have the domicile of her/his parent(s) or legal guardians(s), unless the student has maintained continuous residence in the Commonwealth for other than educational purposes for a period of at least 12 months immediately prior to her/his initial enrollment at The Pennsylvania State University, and, the student continues to maintain such separate residence.
2. A student who has resided in the Commonwealth *for other than educational purposes* for at least a period of twelve (12) months immediately preceding his/her initial enrollment at The Pennsylvania State University is presumed to have a Pennsylvania domicile.
3. A student who has not resided continually in Pennsylvania for a period of twelve (12) months immediately preceding her/his initial enrollment at The Pennsylvania State University is presumed to have a non-Pennsylvania domicile.
4. A student requesting to be classified as a Pennsylvania resident for tuition purposes must be a citizen of the United States or must have indicated by formal action her/his intention to become a citizen or must have been admitted to the United States on an immigrant visa. A student admitted to the United States on a tourist or a student (nonimmigrant) visa is not eligible for a classification as a Pennsylvania resident for tuition purposes unless the student has indicated by formal action her/his intention to become a United States citizen.
5. A United States government employee or member of the armed forces who was a resident of Pennsylvania immediately preceding his/her entry into government service and who has continuously maintained Pennsylvania as her/his domicile will be presumed to have a Pennsylvania domicile. Military personnel and their dependents who are assigned to an active duty station in Pennsylvania and who reside in Pennsylvania shall be charged in-state tuition rates.
6. A student receiving a scholarship, guaranteed loan, grant, or other form of financial assistance dependent upon residence in a state other than Pennsylvania is not a Pennsylvania resident for tuition purposes.

RECLASSIFICATION AS A PENNSYLVANIA RESIDENT

A student requesting reclassification as a Pennsylvania resident for tuition purposes must demonstrate by clear and convincing evidence that his/her domicile is in Pennsylvania, and that his/her presence in Pennsylvania is not primarily for educational purposes. Each request shall be decided individually on the basis of all evidence submitted by the petitioner. Accordingly, it is not possible to list a specific combination of factors or set of circumstances which, if met, would ensure reclassification for tuition purposes.

RECLASSIFICATION PROCEDURE

1. A student may challenge her/his residence classification by filing a written petition with the person or committee designated to consider such challenges at the University. Such person or committee shall consider such petition and render a timely decision that shall constitute an exhaustion of administrative remedies.
2. Any reclassification resulting from a student's challenge or appeal shall be effective at the beginning of the semester or session during which the challenge or appeal was filed or at the beginning of the following semester or session. The decision as to which semester or session becomes the effective date shall rest with the person or committee rendering the decision on reclassification.
3. A student who changes her/his place of residence from Pennsylvania to another state is required to give prompt written notice of this change to the University and shall be considered for classification as a non-Pennsylvanian for tuition purposes effective with the date of such change.
4. A dependent resident student whose parent(s) or legal guardian(s) move outside of the Commonwealth may remain a Pennsylvania resident for tuition purposes if she/he continues to maintain a separate domicile within the Commonwealth.

GENERAL INFORMATION

NONRESIDENT STUDENT CLASSIFICATION

A student is initially classified as a nonresident based on information provided by the student when applying for admission to the University. The initial classification is made as follows:

1. Undergraduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Academic Services Officer
 - b. All other locations—Undergraduate Admissions Office, The Pennsylvania State University, University Park, PA 16802
2. Graduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Academic Services Officer
 - b. All other locations—Dean of the Graduate School
3. Medical Student
Office of Student Affairs, The Milton S. Hershey Medical Center

A student may challenge his/her residency classification by filing a written petition as follows:

1. Undergraduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Financial Officer
 - b. All other locations—Fee Assessor, University Park Campus
2. Graduate Student
 - a. Penn State Harrisburg—Penn State Harrisburg Financial Officer
 - b. All other locations—Fee Assessor, University Park Campus
3. Medical Student
Controller, The Milton S. Hershey Medical Center

The appropriate University official reviews the student's petition and makes a decision.

The student may appeal that officer's residency decision to the University Appeals Committee on Residence Classification having representation from the Office of the Deputy Controller, Undergraduate Admissions, or the Graduate School. The committee's decision on appeal is final.

ACADEMIC PROGRAMS

GENERAL EDUCATION

The University Faculty Senate, at its meeting on April 30, 1985, adopted the following statement as a comprehensive definition of general education:

General Education is the breadth of knowledge involving the major intellectual and aesthetic achievements of humanity. This must include understanding and appreciation of the pluralistic nature of knowledge epitomized by the natural sciences, mathematics, social-behavioral sciences, humanities, and the arts. General Education aids students in developing intellectual curiosity, strengthened ability to think, and a deeper sense of aesthetic appreciation. General Education, in essence, aims to cultivate a knowledgeable, informed, literate human being.

An effective General Education program enables students to:

1. acquire knowledge through critical reading and listening;
2. analyze and evaluate, where appropriate in a quantitative manner, the acquired knowledge;
3. integrate knowledge from a variety of sources and fields;
4. make critical judgments in a logical and rational manner;
5. recognize and comprehend the role of physical activity in meeting the demands of daily living;
6. learn to communicate effectively;
7. comprehend the reality of international interdependence and cultural diversity;
8. comprehend the role of aesthetic and creative activities in meeting the demands of daily living.

Courses taken to meet General Education program requirements may not be taken under the Satisfactory-Unsatisfactory option.

The General Education program for Penn State associate degree students consists of 21 credits distributed among communication and quantification skills (6 credits); the distribution areas (12 credits), including breadth and depth courses in the natural sciences (3 credits), arts (3 credits), humanities (3 credits), and social and behavioral sciences (3 credits); and an additional 3 credits in any General Education area.

Opportunities for qualified students to substitute advanced courses for courses on the breadth and depth lists are indicated below.

A. Breadth Courses

Breadth courses introduce and integrate major areas of knowledge, presenting the most fundamental and universal concepts, issues, and achievements in the discipline or cluster of disciplines. They represent the offering unit's special effort to help a wide range of students obtain coherent overviews of major findings and modes of investigation. While each breadth course stimulates further interest in the discipline(s), it may be, for many students, the only course taken in the discipline(s). Each breadth course, therefore, develops for such students a substantial, nonspecialized appreciation for the primary ways in which the discipline or cluster of disciplines contributes to a useful understanding of the human condition and/or its environment.

1. *Natural sciences breadth courses* emphasize the order, diversity, and beauty of nature, the concepts in the disciplines most useful to an informed citizenry, and how scientific understanding can bear on the formulation of individual and social values. The courses promote understanding of the inductive and deductive reasoning processes and develop a student's ability to reason inductively and deductively.

Scientific and technical disciplines require more advanced courses in basic sciences as essential foundations for further study in a range of majors. Such courses, which assume an already developed sense of the "general" aspects of the field, may be substituted for natural sciences breadth courses in any major.

ACADEMIC PROGRAMS

2. *Arts breadth courses* emphasize how the traditions, literature, and history of the arts and architecture express the cultural values of society. These courses introduce major figures, ideas, and artistic achievements in coherent patterns across substantial chronological ranges. They examine the terminology, techniques, attitudes, ideas, and skills that the arts areas comprise, so students can understand the approaches to human existence that distinguish the arts.
3. *Humanities breadth courses* emphasize coherent overviews of cultural and intellectual currents shaping or interpreting individual and social values. In thematically coherent patterns, they relate major figures, ideas, achievements, and/or world-shaping events to the most enduring continuities in human experience. Breadth courses in history, literature, philosophy, religion, and interdisciplinary humanities explore these topics across substantial chronological ranges, consistently relating the past to the present.
4. *Social and behavioral science breadth courses* emphasize major concepts, findings, and analytic methods most useful to an informed citizenry that needs to understand politics, economic systems, social institutions, individual and group behavior, and human communication. Such courses emphasize how an understanding of the multiple nature of causality in social settings can bear on the formulation of individual and social values.

B. Depth Courses

Depth courses, while emphasizing the same concepts as the breadth courses, are narrower in scope. Depth courses provide opportunities to pursue selected major concepts, issues, and achievements in more detail than is possible in breadth courses. Depth courses also emphasize how a particular focus, whether on the past or present, is relevant to current individual, social, and/or scientific issues. The varying degrees of specialization in depth courses extend or deepen the perspectives, knowledge, and analytic skills emphasized in breadth courses.

Listed depth courses are generally numbered below the 200 level. A student who has developed general interests and competencies in any of the four distribution areas may, in consultation with an adviser and with the approval of the student's college dean, substitute 200- to 499-level courses for those on the list of depth courses.

COURSES TO BE USED FOR GENERAL EDUCATION

A. Skills (6 credits)

1. **WRITING/SPEAKING** (3 credits)
Courses designated with the suffix GWS satisfy this component.
2. **QUANTIFICATION** (3 credits)
Courses designated with the suffix GQ satisfy this component.

B. Distribution Component (12 credits)

Both breadth and depth courses satisfy this component. Students must take at least 3 credits of breadth or depth courses in each of the four areas of the distribution component.

1. *Breadth courses* are identified by the suffix G followed by a letter code corresponding to each of the distribution areas.⁶
 - a. Natural sciences breadth courses (GN)
 - b. Arts breadth courses (GA)
 - c. Humanities breadth courses (GH)
 - d. Social and behavioral sciences breadth courses (GS)
2. *Depth courses* are identified by the suffix D followed by a letter code corresponding to each of the distribution areas, e.g., depth courses in the natural sciences carry the suffix DN. A student may, in consultation with the adviser and the approval of the student's college dean, substitute 200- to 499-level courses for those on the list of depth courses.

- a. Natural sciences depth courses (DN)
- b. Arts depth courses (DA)
- c. Humanities depth courses (DH)
- d. Social and behavioral sciences depth courses (DS)

C. An additional 3 credits in any General Education area

Students whose academic majors are in the areas of natural sciences, arts, humanities, and social and behavioral sciences may not meet the General Education program components by taking courses in the department or program *identical* to that of the academic major. All General Education courses are to help students explore and integrate information beyond the specific focuses of their major.

WRITING ACROSS THE CURRICULUM

Beginning in summer 1992, entering associate degree students are required to complete at least 3 credits of writing-intensive courses prior to graduation.

CULTURAL DIVERSITY

Beginning in summer 1992, entering associate degree students are required to take either 3 credits of Diversity Focused (DF/DFV) courses or 6 credits of Diversity Enhanced (DE/DEX) courses.

MAJORS

AGRICULTURAL BUSINESS (2 AGB)

PROFESSOR NEIL B. GINGRICH, *in charge*

The Agricultural Business major helps prepare students for employment in commercial agriculture and businesses serving agriculture. Three options allow students to specialize in either crop or livestock production or in agricultural business, which provides training in management, business organization, and sales.

The first two semesters are offered at selected Commonwealth Campuses, where students fulfill basic course requirements in accounting, business, English, and natural and social sciences. The second year at the University Park Campus provides course work in livestock and crop production, management, and agricultural business. As part of the requirements, there are supporting courses in agricultural engineering, farm management, agricultural marketing, and sales. Each option allows the student a choice of electives to satisfy special interests and needs.

For the Associate in Science degree in Agricultural Business, a minimum of 68 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(9-12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

ELECTIVES: 0-6 credits

X X

AGRICULTURAL BUSINESS

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

REQUIREMENTS FOR THE MAJOR: 53-59 credits

(This includes 9-12 credits of General Education courses; 6 credits of GWS courses; 3 credits of DN courses; 0-3 credits of DS courses)

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 26 credits

PRESCRIBED COURSES (19 credits)

| | | |
|--|---|---|
| ACCTG 200(3), § B LAW 243(3), § BIOL 110 DN(4), CHEM 011(3), ENGL 015 GWS;DEX(3), SPCOM 100 GWS(3) | X | — |
|--|---|---|

ADDITIONAL COURSES (7)

| | | |
|--------------------------------------|---|---|
| ENGL 202A GWS or 202D GWS(3) | X | — |
| BIOL 220W DN, 230W DN, or 240W DN(4) | X | — |

REQUIREMENTS FOR THE OPTION: 27-33 credits

ANIMAL PRODUCTION OPTION: 33 credits

PRESCRIBED COURSES (18 credits)

| | | |
|--|---|---|
| AGRO 028(3), AN SC 100(3), 202(3), A S M 101(3), PTYSC 200(1), SOILS 101(3) | — | X |
|--|---|---|

ADDITIONAL COURSES (6 credits)

| | | |
|-----------------------------------|---|---|
| AG EC 101 DS, § 106, § or 208(3)§ | — | X |
| AN SC 007 or 201(3) | — | X |

SUPPORTING COURSES AND RELATED AREAS (9 credits)

| | | |
|---|---|---|
| Select 6 credits in agricultural economics | — | X |
| Select 3 credits in agricultural systems management | — | X |

CROP PRODUCTION OPTION: 27 credits

PRESCRIBED COURSES (18 credits)

| | | |
|--|---|---|
| AG EC 102(3), AGRO 028(3), A S M 101(3), 206(3), ENT 012(3), SOILS 101(3) | — | X |
|--|---|---|

ADDITIONAL COURSE (3 credits)

| | | |
|-----------------------------------|---|---|
| AG EC 101 DS, § 106, § or 208(3)§ | — | X |
|-----------------------------------|---|---|

SUPPORTING COURSES AND RELATED AREAS (6 credits)

| | | |
|---|---|---|
| Select 3 credits in animal science or poultry science | — | X |
| Select 3 credits in horticulture | — | X |

GENERAL OPTION: 33 credits

PRESCRIBED COURSES (6 credits)

| | | |
|----------------------------|---|---|
| AG EC 297(3), SOILS 101(3) | — | X |
|----------------------------|---|---|

ADDITIONAL COURSES (15 credits)

| | | |
|---|---|---|
| AG EC 101 DS§ or 208(3)§; AG EC 102 or 232(3) | — | X |
| AG EC 106 or 200(3); AGRO 028 or PLTSC 200(3) | — | X |
| MGMT 100 or MKTG 220(3) | — | X |

§ A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

| | Scheduling Recommendation by Semester Standing | |
|---|---|-----|
| | 1-2 | 3-4 |
| SUPPORTING COURSES AND RELATED AREAS (12 credits) | | |
| Select 3 credits in agriculture or business | — | X |
| Select 3 credits in agricultural systems management | — | X |
| Select 6 credits in animal or poultry science | — | X |

ARCHITECTURAL ENGINEERING TECHNOLOGY (2 AET)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology
and Commonwealth Engineering, University Park Campus*

PROFESSOR JOSEPH BURINSKY, *Program Coordinator, Worthington Scranton Campus*

This major is designed to provide technically trained personnel between the level of high school graduate and professional engineer or architect to support the architectural design/construction industry, and technical support firms.

Graduates of the Architectural Engineering Technology major may qualify for admission to baccalaureate degree majors in Environmental Engineering Technology, Mechanical Engineering Technology, or Structural Design and Construction Engineering Technology offered at Penn State Harrisburg.

For the Associate in Engineering Technology degree in Architectural Engineering Technology, a minimum of 72 credits is required. These options are accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the option are offered.

GENERAL OPTION: This option helps prepare students to translate sketches and design concepts into working drawings and specifications, and to work with architects, structural engineers, and all phases of the building/construction industry.

BUILDING ENVIRONMENTAL SYSTEMS TECHNOLOGY OPTION: This option helps prepare students for the Heating, Ventilating, Air Conditioning and Refrigeration (HVAC&R) industry as system designers, equipment sales representatives, building automation supervisors, and indoor air quality specialists.

| Scheduling Recommendation by Semester Standing | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63-64 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses)

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 42 credits

PRESCRIBED COURSES (42 credits)

| | | |
|---|---|---|
| AE T 101(3), § 102(3), 103(3), CMPSC 101 GQ(3), | | |
| EG T 101(1), 102(1), ENGL 015 GWS;DEX(3), | | |
| MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN(3) | X | — |
| AE T 204(3), 210W(3), § PHYS 151(3), SPCOM 100 GWS(3) | — | X |

§ A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

BIOMEDICAL EQUIPMENT TECHNOLOGY

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

REQUIREMENTS FOR THE OPTION: 21-22 credits

GENERAL OPTION: 21-22 credits

PRESCRIBED COURSES (16 credits)

| | | |
|---------------------------------------|---|---|
| AE T 113(2), MCH T 111(3) | X | — |
| AE T 206(2), 207(3), 214(3), § 215(3) | — | X |

ADDITIONAL COURSES (5-6 credits)

Select 5-6 credits from the following technical courses:

| | | |
|--|---|---|
| AE T 212, 297, CHEM 011, CMPSC 102, EE T 100, EG T 103, 104, 201, 297, IE T 105, MATH 140 GQ, 231, 250, MCH T 213, ME T 207, 281 | — | X |
|--|---|---|

BUILDING ENVIRONMENTAL SYSTEMS TECHNOLOGY OPTION: 21 credits

PRESCRIBED COURSES (15 credits)

| | | |
|-----------------------------|---|---|
| AE T 121(2), § ME T 281(4) | X | — |
| AE T 227(3), 228(3), 229(3) | — | X |

ADDITIONAL COURSES (6 credits)

Select 6 credits from the following technical courses:

| | | |
|--|---|---|
| AE T 212, 297, CHEM 011, CMPSC 102, EE T 100, EG T 103, 104, 201, 297, IE T 105, MATH 140 GQ, 231, 250, MCH T 213, ME T 207, 281 | — | X |
|--|---|---|

BIOMEDICAL EQUIPMENT TECHNOLOGY (2 BET)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology
and Commonwealth Engineering, University Park Campus*

PROFESSOR SCOTT SEGALWITZ, *Program Coordinator, New Kensington Campus*

During the past several decades, the medical community has grown to depend increasingly on machines for the delivery of quality health care. Biomedical equipment technicians are men and women responsible for maintaining these machines in accurate and safe working order. Their tasks include functional and safety inspecting, preventive maintenance, calibration, troubleshooting, and repair of this equipment. In addition, they may be involved in equipment control programs, in electrical safety assurance programs, and in training hospital personnel in the safe and proper use of the equipment. The classroom and laboratory portions of this major focus on electronically based patient monitoring equipment. The student is, however, exposed to a much broader spectrum of biomedical equipment through a ten-week practical internship in an approved health care facility. Graduates of the Biomedical Equipment Technology major may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Harrisburg and at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Biomedical Equipment Technology, a minimum of 75 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

§ A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

Scheduling Recommendation
by Semester Standing

1-2 3-4 Summer

REQUIREMENTS FOR THE MAJOR: 66 credits

(This includes 12 credits of General Education courses: 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (63 credits)

| | | | |
|---|---|---|---|
| CMPSC 101 GQ(3), ENGL 015 GWS;DEX(3), MATH 087 GQ(5), 088 GQ(5) | X | — | — |
| EE T 101(3), 109 (1), 114(3), § 117(3), § 118(1), § 120(1), EG T 101(1), 102(1), ENGR 002(1) | X | — | — |
| BIOL 041 DN(3), CHEM 011(3), PHYS 150 GN(3), SPCOM 100 GWS(3) | — | X | — |
| BE T 201(5), 202(5), 204(3), 205(3) | — | X | — |
| BE T 203 (4) | — | — | X |

ADDITIONAL COURSE (3 credits)

Select 3 credits from the following technical courses:

| | | | |
|--|---|---|---|
| BE T 297, BIOL 029, CE T 261, CMPSC 102, EE T 211, 213W, 297, EG T 201, I E 315, or ME T 207 | — | X | — |
|--|---|---|---|

BUSINESS ADMINISTRATION (2 B A)PROFESSOR BENJAMIN HENSZEY, *in charge*

The two-year, college-level academic Business Administration major is designed to provide instruction in business administration that fulfills the requirements of various levels of responsibility higher than that held by high school graduates.

The primary objective of this major is to provide a managerially oriented program with sufficient communicative and mathematical skills, socially relevant course work, and advanced courses in specific business specialties to develop a well-rounded graduate.

Graduates of the Business Administration major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Business Administration, Humanities, or Public Policy offered by Penn State Harrisburg. Or they may qualify for admission to the baccalaureate degree majors in Accounting, Business Economics, General Business, Management, or Management Information Systems offered at Penn State Erie, The Behrend College.

For the Associate in Science degree in Business Administration, a minimum of 68 credits is required.

Scheduling Recommendation
by Semester Standing

1-2 3-4

GENERAL EDUCATION: 21 credits

(6 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)**REQUIREMENTS FOR THE MAJOR: 53 credits**

(This includes 6 credits of GWS General Education courses.)

PRESCRIBED COURSES (33 credits)

| | | |
|--|---|---|
| MSIS 200 | X | — |
| ACCTG 200(3), 204(3), B LAW 243(3), ENGL 015 GWS;DEX(3), FIN 100(3), § M I S 100(3), MGMT 100(3), § MKTG 221 DE(3), § SPCOM 100 GWS(3) | X | X |
| ENGL 202D GWS(3) | — | X |

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

COMPUTER ENGINEERING TECHNOLOGY

Scheduling Recommendation by Semester Standing

| | 1-2 | 3-4 |
|--|-----|-----|
| ADDITIONAL COURSES (18 credits) | | |
| ECON 002 GS, 004 GS, or 014 GS(3) [#] | — | X |
| Select 15 credits from ACCTG 150, 160, 170, 186, B A 100, 195, 250, B LOG 301, 304, 305, CMPSC 101 GQ, 102, 103 GQ, 140, 203 GQ, ECON 002 GS,* 004 GS,* FIN 108, H P A 101, 301, 310, INS 102, L I R 100 DS, M I S 101, 103, 106, 110, 111, MGMT 150, MKTG 150, 160, 180, 190, 220, MSIS 201, OPMGT 150, PHIL 106, R EST 100 | — | X |
| SUPPORTING COURSES AND RELATED AREAS (2 credits) | | |
| Select 2 credits in exercise and sport science | X | X |

COMPUTER ENGINEERING TECHNOLOGY (2CPET)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology and Commonwealth Engineering, University Park Campus*

PROFESSOR THOMAS G. SMITH, *Program Coordinator, Schuylkill Campus*

This major is designed to prepare graduates for technical positions in the rapidly expanding field of computers and their applications. A broad background in electrical and electronic principles is used as a foundation upon which to build the basic concepts of the microprocessor, to examine its internal functions, and to investigate its applications. Exposure to a variety of microprocessor computer systems and devices used with computers as well as hands-on experience in the operation, analysis, and construction of small computer systems provides graduates with a sound foundation for installing, diagnosing, and servicing of computer systems and the devices used with them.

Graduates of the Computer Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology or in Computer Engineering Technology offered at Penn State Harrisburg. Or they may qualify for the baccalaureate Electrical Engineering Technology major offered at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Computer Engineering Technology, a minimum of 73 credits is required.

Scheduling Recommendation by Semester Standing

GENERAL EDUCATION: 21 credits
(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 64-66 credits

(This includes 12 credits of General Education courses: 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

| | | |
|---|---|---|
| PRESCRIBED COURSES (60 credits) | | |
| EE T 101(3), 109(1), 114(3), § 117(3), § 118(1), 120(1), EG T 101(1), 102(1), ENGL 015 GWS;DEX(3), ENGR 002(1), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN(3) | X | — |
| CMPSC 101 GQ(3), EE T 205(1), 210(3), 211(4), § CMPET 240(5), 241(4), 242(3), PHYS 151(3), SPCOM 100 GWS (3) | — | X |

[#]Students going on to a four-year program should not take ECON 014 GS.

*Select one not taken above.

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

ADDITIONAL COURSES (1-3 credits)

Select 1-3 credits from the following technical courses:

BI SC 003 GN, CHEM 011, 012 DN, CE T 261, CMPET 297,
CMPSC 102, EE T 297, MCH T 213, or ME T 207

| | |
|---|---|
| — | X |
|---|---|

SUPPORTING COURSES AND RELATED AREAS (3 credits)

Select 3 credits in computer science

| | |
|---|---|
| — | X |
|---|---|

COMPUTER SCIENCE (2CPSC)PROFESSOR M. DEAN FENTON, *in charge*

The primary objective of the two-year Computer Science major is to prepare graduates for immediate and continuing employability as application programmers, associate systems designers, or associate systems programmers.

To meet this objective the major is designed to ensure a thorough knowledge of the techniques of programming general purpose digital computers, and includes extensive practice—using contemporary programming technologies—in the analysis, organization, validation, and documentation of effective computer code. The major also includes practical knowledge of the logical organization of modern digital computers and related peripheral equipment, the structure of operating systems and compilers, and considerations in the design of information systems.

The General Education component provides the student with an extension to the basic educational foundation. The general Requirements for the Major give the graduate technical competence in the computing and data processing field. The Application Specialization provides a practical knowledge of an area of application within which the graduate may profitably utilize the acquired computing talent.

For the Associate in Science degree in Computer Science, a minimum of 64 credits is required.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

GENERAL EDUCATION: 21 credits

(9 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See the description of General Education at front of *Bulletin*.)**REQUIREMENTS FOR THE MAJOR: 52 credits**

(This includes 9 credits of General Education courses; 3 credits of GQ courses; 6 credits of GWS courses:)

PRESCRIBED COURSES (34 credits)

CMPSC 100(3), 101 GQ(3), 102(3), § 140(3), §

ENGL 015 GWS; DEX(3), SPCOM 100 GWS(3)

| | |
|---|---|
| X | X |
|---|---|

CMPSC 142(3), 144(4), § 154(3), 164(3), 174(2), 175(1)

| | |
|---|---|
| — | X |
|---|---|

ADDITIONAL COURSES (6 credits)

ENGL 202C GWS or 202D GWS(3)

| | |
|---|---|
| X | X |
|---|---|

Select 3 credits from MATH 021 GQ or above

| | |
|---|---|
| X | X |
|---|---|

SUPPORTING COURSES AND RELATED AREAS (12 credits)

Select 9 credits of related courses in a technical specialization in

consultation with adviser

| | |
|---|---|
| X | X |
|---|---|

Select 3 credits in MSIS, STAT, or MATH (above MATH 021 GQ)

| | |
|---|---|
| X | X |
|---|---|

§ A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

DIETETIC FOOD SYSTEMS MANAGEMENT (2EDSM)

PROFESSOR ELLEN P. BARBROW, in charge

An associate degree in Dietetic Food Systems Management helps broaden a student's knowledge of food service management and nutrition and allows for the application of that knowledge in a variety of settings. The degree offers an opportunity for individuals employed in food service operations in health care facilities and schools to pursue careers as dietetic professionals. The major is designed to provide a foundation in general education and a strong management orientation balanced with technical skills needed in food service management and nutrition care.

Students in the major are required to take a prescribed set of core courses in dietetic food systems management and then may choose a specific emphasis by selecting a series of courses in either health care or school food service. Graduates with a health care emphasis are eligible for technician membership in the American Dietetic Association and they can become Registered Dietetic Technicians after passing the credentialing examination. Students choosing to emphasize school food service are eligible for certification with the American School Food Service Association at the Manager III level.

To be eligible for admission to this major, candidates must have access to a food service operation to complete supervised field experience. For those students who want to meet the membership requirements of the American Dietetic Association, the field experience must be supervised by a registered dietitian.

Dietetic Programs through Distance Education also offers this major. Courses are available primarily through the Department of Independent Learning or students may choose to complete available courses through resident instruction.

For the Associate in Science degree in Dietetic Food Systems Management, 67 credits are required.

| Scheduling Recommendation by Semester Standing | | |
|---|-----|-----|
| | 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits

(6-9 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

ELECTIVES: 3-6 credits

REQUIREMENTS FOR THE MAJOR: 49 credits

(This includes 6-9 credits of General Education courses: 3 credits of GWS, 0-3 credist of GN, 3 credits of GS.)

PRESCRIBED COURSES (26 credits)

| | | |
|---|---|---|
| D S M 101(3), § 103(3), § 195(3), § 205(3), § 250(3), § ENGL 015 GWS;DEX(3) | X | — |
| D S M 260(4), § 295W(4)§ | — | X |

ADDITIONAL COURSES (23 credits)

| | | |
|--|---|---|
| Select 3 credits from NUTR 151§ or 251 GHS(3)§ | X | — |
| Select 3 credits from SOC 001 GS or PSY 002 GS(3) | X | — |
| Select 3 credits from D S M 265, § 270, § or HR&IM 319§ | — | X |
| Select either a or b: | | |
| a. Health Care (14 credits) | | |
| D S M 100(1), § BI SC 004 GN(3) | X | — |
| NUTR 252(4), § 359(2)§ | — | X |
| Select 4 credits in consultation with adviser from University-wide offerings that enhance competence in a health care career | — | X |

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

| | <i>Scheduling Recommendation by Semester Standing</i> | |
|---|---|-----|
| | 1-2 | 3-4 |
| b. School Food Service (14 credits) | | |
| ACCTG 200(3), D S M 105(2), § 304(3), § HR&IM 337(3)§ | X | X |
| Select 3 credits from HD FS 129 GS;DE(3), 229 DS(3), or 315(3) | — | X |

ELECTRICAL ENGINEERING TECHNOLOGY (2 EET)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology
and Commonwealth Engineering, University Park Campus*

PROFESSOR ROBERT BUCZYNSKI, *Program Coordinator, Berks Campus*

This major helps prepare graduates for technological service with manufacturers of electrical, electronic, and computer equipment; electrical utilities; and electrical maintenance and instrumentation departments of various industrial concerns. The principal objective is to provide a practical knowledge of electronic, digital, and microprocessor theory as well as electrical machinery and its applications.

Graduates of the Electrical Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology or Energy Technology offered at Penn State Harrisburg. Or they may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Electrical Engineering Technology, a minimum of 72 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

| <i>Scheduling Recommendation by Semester Standing</i> | |
|---|-----|
| 1-2 | 3-4 |

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See General Education description in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63-64 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (62 credits)

| | | |
|---|---|---|
| CMPSC 101 GQ(3), EE T 101(3), 109(1), 114(3), § 117(3), § 118(1), § 120(1), EG T 101(1), 102(1), ENGL 015 GWS;DEX(3), ENGR 002(1), MATH 087 GQ (5), 088 GQ(5) | X | — |
| EE T 204(2), 205(1), 206(1), 210(3), 211(4), 213(3), 215(3), 216(3), 219(1), 221(1), PHYS 150 DN(3), 151(3), SPCOM 100 GWS(3) | — | X |

ADDITIONAL COURSES (1-2 credits)

Select 1-2 credits from the following technical courses:

| | | |
|---|---|---|
| BI SC 003 GN, CHEM 011, 012 DN, CE T 261, CMPSC 102, EE T 297, EG T 103, 104, I E 315, IE T 105, MATH 140 GQ, 141 GQ, MCH T 110, or 111 | — | X |
|---|---|---|

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

FOREST TECHNOLOGY (2 FORT)

PROFESSOR KENNETH J. SWISHER, *in charge*

The objectives of the Forest Technology major are to train forestry field personnel in the technical aspects of evaluating, managing, and protecting forest resources. Practicums held on the Michaux State Forest, adjacent to the campus, stress field applications of classroom theory. Both written and oral communication skills are stressed in all courses. Graduates of the program are employed by businesses including federal and state timber management and recreation programs, urban tree service companies, pulp and paper manufacturers, surveying and landscaping firms, power companies, and other businesses requiring personnel skilled in field data-gathering analysis and presentation.

Some graduates transfer their credits to bachelor degree programs such as business management, wildlife science, forest science, geology, leisure studies, and environmental resource management.

For the Associate in Science degree in Forest Technology, a minimum of 66 credits is required.

Scheduling Recommendation by Semester Standing

| | | |
|-----|--------|-----|
| 1-2 | Summer | 3-4 |
|-----|--------|-----|

GENERAL EDUCATION: 21 credits

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 45 credits

PRESCRIBED COURSES (39 credits)

FOR 105(3), § 137(1), 138(1), 140(2), 141(4), 240(3), §

245(2), 250(3) §

FOR 106(2), § 108(1), 822(1)

FOR 220(3), 221(1), 242(3), 814(1), 860(1)

FOR 234(3), 241(4)

| | | |
|---|---|---|
| X | — | — |
| — | X | — |
| — | — | X |
| — | — | X |

ADDITIONAL COURSES (6 credits)

Select 6 credits from ACCTG 200, FOR 817,
WILDL 101, or 207

| | | |
|---|---|---|
| — | — | X |
|---|---|---|

HOTEL, RESTAURANT, AND INSTITUTIONAL MANAGEMENT (2HRIM)

JAMES A. BARDI, *Director*

The Hotel, Restaurant, and Institutional Management major is an intensive four-semester major designed to prepare students for managerial positions in the hospitality industry. The course of study places heavy reliance on experience acquired in an on-the-job setting.

Students who achieve outstanding records may, upon completing this program, apply for admission to the baccalaureate degree major in Hotel, Restaurant, and Institutional Management in the College of Health and Human Development. Six or more additional semesters of satisfactory work are required to earn the baccalaureate degree. Graduates of this major may qualify for admission to other baccalaureate degree majors.

For the Associate in Science degree in Hotel, Restaurant, and Institutional Management, a minimum of 66 credits is required.

GENERAL EDUCATION: 21 credits

(3 of these 21 credits are included in REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

§ A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

*Scheduling Recommendation
by Semester Standing*

| | |
|-----|-----|
| 1-2 | 3-4 |
|-----|-----|

REQUIREMENTS FOR THE MAJOR: 48 credits

(This includes 3 credits of GWS courses.)

PRESCRIBED COURSES (40 credits)

ACCTG 200(3), ENGL 015 GWS;DEX(3), 202D GWS(3),
HR&IM 201(2), 204(3), 250(4), 260(4), § 270(4), §
295(2), 310(3), 320(3), 337(3), 380(3)

| | |
|---|---|
| X | X |
|---|---|

SUPPORTING COURSES AND RELATED AREAS (8 credits)

Select 3 credits in nutrition

| | |
|---|---|
| X | X |
|---|---|

Select 5 credits in consultation with adviser to develop a

competency in management or general business administration

| | |
|---|---|
| X | X |
|---|---|

HUMAN DEVELOPMENT AND FAMILY STUDIES (2HDFS)NANCY J. KURTZ, *Coordinator*

This major integrates practical and academic experiences to provide the student with entry-level professional competence in one of several human service fields. The objective of the major is to offer a general education background, a knowledge base in life span and family development, and a core of professional skills that may be applied in program planning and service delivery activities. The major is offered as an extended degree, permitting part-time, evening, and independent learning course work credits to be earned.

ADULT DEVELOPMENT AND AGING OPTION: This option is designed to prepare students for a wide variety of service roles in nursing homes, area agencies on aging, senior citizen centers, and other sites for services to the elderly.

CHILD AND YOUTH SERVICES OPTION: This option is designed to prepare students for a variety of service roles in day and residential child and youth care systems, preschools, Head Start centers, and other child and youth service settings.

FAMILY SERVICES OPTION: This option is designed to prepare students for employment, under a variety of job titles, in the delivery of family services. Such services are offered across a wide range of settings: day care, Head Start, parent education, family planning, drug and alcohol programs, agencies for the disabled, child, youth, and family health and welfare agencies.

For the Associate in Science degree in Human Development and Family Studies, a minimum of 62 credits is required.

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)**ELECTIVES: 2-4 credits****REQUIREMENTS FOR THE MAJOR: 49-51 credits**

(This includes 12 credits of General Education courses: 6 credits of GWS courses; 3 credits of GS courses; 3 credits of DH courses.)

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

HUMAN DEVELOPMENT AND FAMILY STUDIES

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 32-33 credits

PRESCRIBED COURSES (26-27 credits)

ENGL 015 GWS;DEX(3), HD FS 129 GS;DE(3),§

PSY 002 GS(3), SPCOM 100 GWS(3)

HD FS 216 DS(3)§

H DEV 395(8-9), HD FS 315 DF(3)§

| | |
|---|---|
| X | — |
| X | X |
| — | X |

ADDITIONAL COURSES (6 credits)

PHIL 103 DH or 104 DH(3)

EDPSY 014 or HD FS 200(3)§

| | |
|---|---|
| X | — |
| X | — |

REQUIREMENTS FOR THE OPTION: 17-18 credits

ADULT DEVELOPMENT AND AGING OPTION: 17-18 credits

PRESCRIBED COURSES (6 credits)

HD FS 249 DS(3),§ 311(3)§

| | |
|---|---|
| X | X |
|---|---|

ADDITIONAL COURSES (2-3 credits)

Select 2-3 credits from H P A 101(3), HL ED 060 GHS(3),

HD FS 218(3),§ 219(3),§ 297(1-3),§ NUTR 251 GHS(3),

PSY 174(3), R P M 120(3), 236(3), 277(3)

| | |
|---|---|
| X | X |
|---|---|

SUPPORTING COURSES AND RELATED AREAS (9 credits)

Select 9 credits in consultation with the adviser from
University-wide offerings that enhance
competence in the option.

| | |
|---|---|
| — | X |
|---|---|

CHILD AND YOUTH SERVICES OPTION: 17-18 credits

ADDITIONAL COURSES (8-9 credits)

HD FS 229 DS§ or 239 DS(3)§

Select 5-6 credits from HD FS 297(1-2),§ 330(1-4),§

HL ED 303 GHS(2), A ED 303(3),

NUTR 251 GHS(3), PSY 213 DS;DE(3)

| | |
|---|---|
| X | X |
| X | X |

SUPPORTING COURSES AND RELATED AREAS (9 credits)

Select 9 credits in consultation with the adviser from
University-wide offerings that enhance
competence in the option.

| | |
|---|---|
| — | X |
|---|---|

FAMILY SERVICES OPTION: 17-18 credits

PRESCRIBED COURSES (6 credits)

HD FS 219(3),§ 311(3)§

| | |
|---|---|
| X | X |
|---|---|

ADDITIONAL COURSES (2-3 credits)

Select 2-3 credits§ from HD FS 218(3), 229 DS, 297(1-3)

| | |
|---|---|
| X | X |
|---|---|

SUPPORTING COURSES AND RELATED AREAS (9 credits)

Select 9 credits in consultation with the adviser from
University-wide offerings that enhance
competence in the option.

| | |
|---|---|
| — | X |
|---|---|

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

LETTERS, ARTS, AND SCIENCES (2 LAS)

PROFESSOR MARGARET M. LYDAY, *in charge*

The objectives of the Letters, Arts, and Sciences major are to broaden the student's understanding, interests, and skills; to help the student become a more responsible, productive member of the family and community; and to offer a degree program with sufficient electives to permit some specialization according to the student's interests or career plans. Letters, Arts, and Sciences is a complete two-year degree major. However, graduates who later seek admission to baccalaureate degree majors may apply baccalaureate credits toward the new degree. Any 800-level credits taken in the Letters, Arts, and Sciences program are not applicable toward most baccalaureate degrees.

In addition to a wide variety of baccalaureate majors offered at University Park Campus, graduates of the Letters, Arts, and Sciences major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Elementary Education, Humanities, or Public Policy offered at Penn State Harrisburg. Or they may qualify for any of a large number of baccalaureate degree majors offered by Penn State Erie, The Behrend College, in business, the liberal arts, and sciences.

For the Associate in Arts degree in Letters, Arts, and Sciences, a minimum of 60 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits[#]

(6 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

ELECTIVES: 15 credits

REQUIREMENTS FOR THE MAJOR: 30 credits^{#§}

(This includes 6 credits of General Education GWS courses.)

PRESCRIBED COURSES (6 credits)

| | | |
|---------------------|---|---|
| ENGL 015 GWS;DEX(3) | X | — |
| SPCOM 100 GWS(3) | — | X |

ADDITIONAL COURSE (3 credits)

| | | |
|------------------------------|---|---|
| ENGL 202A, B, C, or D GWS(3) | — | X |
|------------------------------|---|---|

SUPPORTING COURSES AND RELATED AREAS (21 credits)

| | | |
|---|---|---|
| Select 3 credits in any course designated as arts* | X | X |
| Select 3 credits in any course designated as humanities* | X | X |
| Select 3 credits in any course designated as social and behavioral sciences* | X | X |
| Select 3 credits in any course designated as physical, biological, or earth sciences* | X | X |
| Select 9 credits in any one of the following areas*: arts, humanities, social and behavioral sciences, natural sciences | | |

[#]The required credits of General Education and Requirements for the Major must be baccalaureate-level courses. For students intending to seek admission to a baccalaureate program upon graduation, it is recommended that most, if not all, of the courses be at the baccalaureate level. For those students who will seek a Bachelor of Arts degree upon graduation from Letters, Arts, and Sciences, it is strongly recommended that a foreign language be taken since admission to a Bachelor of Arts program in the College of the Liberal Arts requires one college-level course, or the equivalent, in a foreign language.

[§]A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

*Courses that will satisfy the arts, humanities, social and behavioral sciences, natural sciences, and quantification requirements are defined on the Letters, Arts, and Sciences checklist, which may be obtained from the College of the Liberal Arts associate dean for undergraduate studies at the University Park Campus or from any Letters, Arts, and Sciences representative at the Commonwealth Campuses.

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1-2 3-4

and quantification, and foreign language skills.

(If foreign language courses are chosen, it is recommended
that these courses be in one foreign language sequence.)

X X

MATERIALS ENGINEERING TECHNOLOGY (2MATE)

PROFESSOR W. MURRAY SMALL, *in charge*

The last decade has seen several remarkable changes occurring within the materials industry. First, the profile has shifted among products of commerce away from metals and toward ceramics and polymers. Second, emphasis on the quality of products has increased, with the implementation of on-line instrumental checks for defects and statistical analysis. Third, awareness has broadened about the importance of materials and manufacturing to a strong U.S. economy. Highly trained materials technicians have significant roles to play in this industry. Their training qualifies them to perform and supervise mechanical property and quality assurance tests on a variety of products. This program is designed to supply the student with extensive laboratory background to these key elements of materials technology. Courses are offered to give the student an exposure to the breadth of materials technology both from the basic side and frequent contact with industry.

For the Associate in Engineering Technology degree in Materials Engineering Technology, a minimum of 64 credits is required.

*Scheduling Recommendation
by Semester Standing*
1-2 Summer 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 55 credits

(This includes 12 credits of General Education courses; 6 credits of GWS courses; 3 credits of DN courses; 3 credits of GQ courses.)

PRESCRIBED COURSES (52 credits)

| | | | | |
|--|---|---|---|--|
| CHEM 012 DN(3), 014 DN(1), CMPSC 101 GQ(3), | | | | |
| EG T 101(1), 102(1), ENGL 015 GWS;DEX(3), | | | | |
| MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN(3), 151(3) | X | — | — | |
| ENGL 202C GWS(3), IE T 109(3), MAT T 200(3), [§] | | | | |
| 201(3), [§] 202(3), [§] 203(3), [§] 204(3), [§] SPCOM 100 GWS(3) | — | X | — | |

ADDITIONAL COURSES (3 credits)

| | | | | |
|--------------------------|---|---|---|--|
| IE T 112 or MAT T 295(3) | — | — | X | |
|--------------------------|---|---|---|--|

MECHANICAL ENGINEERING TECHNOLOGY (2 MET)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology
and Commonwealth Engineering, University Park Campus*

PROFESSOR DAVID HUGGINS, *Program Coordinator, New Kensington Campus*

This major helps prepare detail or layout drafters and junior designers for manufacturing industries as well as for the many concerns engaged in installation or erection work. The principal objective is to prepare men and women for employment in machine design, tool and die design, or structural layout. Some graduates are involved in technical or industrial sales, become supervisors in light and heavy industry, or enter management-trainee programs.

[§]A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

MEDICAL LABORATORY TECHNOLOGY

Graduates of this major may qualify for admission to the baccalaureate degree majors in Mechanical Engineering Technology, Structural Design and Construction Engineering Technology, or Energy Technology offered at Penn State Harrisburg. Or they may qualify for admission to the Mechanical Design and Materials option of the baccalaureate degree majors in either Mechanical or Plastics Engineering Technology offered at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Mechanical Engineering Technology, a minimum of 68 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

*Scheduling Recommendation
by Semester Standing*
1-2 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 59 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (56 credits)

| | | |
|---|---|---|
| CMPSC 101 GQ(3), ENGL 015 GWS;DEX(3), EG T 101(1), 102(1), 103(2), 104(1), IE T 101(3), [§] MATH 087 GQ(5), 088 GQ(5), MCH T 111(3), [§] PHYS 150 DN(3) | X | X |
| IE T 212(2) | — | X |
| EE T 100(3), EG T 201(2), IE T 215(3), MCH T 213(3), 214(1), ME T 206(3), [§] 210W(3), PHYS 151(3), SPCOM 100 GWS(3) | — | X |

ADDITIONAL COURSES (3 credits)

Select 3 credits from the following technical courses:

| | | |
|---|---|---|
| AE T 209, 297, CE T 261, 297, EG T 297, IE T 105, 109, 297, ME T 207, 281, 297, or SUR 111 | — | X |
|---|---|---|

MEDICAL LABORATORY TECHNOLOGY (2 MLT)

PROFESSOR PHILIP W. MOHR, *in charge*

This two-calendar-year Medical Laboratory Technology major (four semesters, two summer sessions) is designed to provide the necessary general and technical training for hospital personnel between the level of the medical laboratory technician (certificate program) and the medical technologist (baccalaureate program). The course of study includes one year of intensive clinical experience at an affiliated hospital and the theoretical background necessary for the clinical procedures performed by the certified medical laboratory technician (associate degree program). Upon completion of program requirements, the student receives the associate degree and is eligible to sit for examinations leading to certification and registry as a medical laboratory technician.

Graduates of the Medical Laboratory Technology major may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Humanities, or Public Policy offered at Penn State Harrisburg.

For the Associate in Science degree in Medical Laboratory Technology, a minimum of 70 credits is required.

GENERAL EDUCATION: 21 credits

(11–12 of the 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

[§]A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

*Scheduling Recommendation
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|-----|---------|-----|
| 1-2 | Summer* | 3-4 |
|-----|---------|-----|

REQUIREMENTS FOR THE MAJOR: 60-63 credits

(This includes 11-12 credits of General Education courses; 6 credits of GWS courses; 3 credits of GN courses; 2-3 credits of GQ courses.)

PRESCRIBED COURSES (58-59 credits)

| | | | |
|--|---|---|---|
| BIOL 041 DN(3), 042(1), 101 DN(4), CHEM 012 DN(3-4), 014 DN(1), MICRB 201(3), 202 (2) | X | — | — |
| ENGL 015 GWS;DEX(3), MICRB 150(4), CHEM 034 (3) | X | X | — |
| SPCOM 100 GWS(3) | — | X | — |
| CMPSC 001 (1) | — | X | X |
| MICRB 151A(7), § 151C(6), § 151D(4), § 151E(2), § 151F(2), § 151W(6)§ | — | — | X |

ADDITIONAL COURSES (2-4 credits)

Select 2-4 credits from MATH 017 GQ(3), 018 GQ(3),
021 GQ(3), 022 GQ(3), 026 GQ(3), 110 GQ(4),
111 GQ(2), 140 GQ(4), STAT 200 GQ(4),
or 250 GQ (3)

| | | |
|---|---|---|
| X | — | — |
|---|---|---|

†NUCLEAR ENGINEERING TECHNOLOGY (2 NET)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology
and Commonwealth Engineering, University Park Campus*
PROFESSOR MASOUD FEIZ, *Program Coordinator, Beaver Campus*

This major is designed to provide technically trained personnel to support the rapidly developing nuclear industry. The wide scope of training helps prepare nuclear technicians for careers in radiation safety, reactor operations, radioisotope handling, nuclear and control instrumentation, fuel fabrication, and health physics. A nuclear technician may work as a radiological safety specialist, engineering aide, or enter training as a reactor operator at a nuclear facility.

Graduates of the Nuclear Engineering Technology major may qualify for admission to the baccalaureate degree majors in Electrical Engineering Technology offered at Penn State Harrisburg or at Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Nuclear Engineering Technology, a minimum of 70 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 61 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

*Scheduling of courses in summer session depends on campus location.

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

†No new students are being accepted into this program.

*Scheduling Recommendation
by Semester Standing*

| 1-2 | 3-4 |
|-----|-----|
|-----|-----|

PRESCRIBED COURSES (61 credits)

| | | |
|---|---|---|
| CHEM 011(3), CMPSC 101 GQ(3), EE T 101(3), 109(1), EG T 101(1), 102(1), ENGL 015 GWS;DEX(3), 202C GWS(3), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN (3), SPCOM 100 GWS(3) | X | — |
| NE T 201(3), 202(4), 203(3), 204(3), 205(2), 212(3), 214(3), 215(3), PHYS 151(3) | — | X |

NURSING (2NURS)

PROFESSOR FREIDA M. HOLT, *Director, School of Nursing*

This major helps prepare graduates for employment primarily in hospitals and long-term care facilities. Graduates provide nursing care to individuals with commonly occurring acute or chronic health problems. After earning the associate degree, students are eligible to take the registered nurse examination for licensure by the State Board of Nursing. National League for Nursing accreditation of the program will be requested following graduation of the first class.

Students must carry liability insurance and have an annual health examination. Students are also responsible for their own transportation to clinical settings. The use of a car may be necessary.

Graduates of this major may qualify for admission to the baccalaureate degree program in Nursing.

For the Associate in Science degree in Nursing, a minimum of 67 credits is required.

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GENERAL EDUCATION: 21 credits

(15 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 61 credits[§]

(This includes 15 credits of General Education courses; 3 credits of GN courses; 3 credits of GQ courses; 6 credits of GS courses; 3 credits of GWS courses)

PRESCRIBED COURSES (58 credits)

| | | |
|--|---|---|
| BIOL 029(4), 041 DN(3), 042(1), ENGL 015 GWS;DEX(3), HD FS 129 GS;DE(3), PSY 002 GS(3), SOC 001 GS(3), NURS 101(8), 102(8) | X | — |
| MICRB 106 GN(2), 107 GN(1), NURS 201(9), 202W(10) | — | X |

ADDITIONAL COURSES (3 credits)

| | | |
|--|---|---|
| Select 3 credits from MATH 021 GQ or above | — | X |
|--|---|---|

[§]A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

OCCUPATIONAL THERAPY (2 O T)

PROFESSOR HAROLD E. CHEATHAM, *Head, Counselor Education, Counseling Psychology, and Rehabilitation Services Education*
 PROFESSOR HARU HIRAMA, Ed.D., OTR/L, *in charge*

This major helps prepare graduates to be Occupational Therapy Assistants who are qualified to be employed by agencies that provide occupational therapy services. The goal of occupational therapy is to enable the client to be as independent as possible in the daily performance of self-care, productive, and leisure activities. General education, basic science, and occupational therapy courses are followed by supervised field experience. Certification by the American Occupational Therapy Certification Board and state licensure that may be required for employment are separate from degree requirements.

To enter this major, students must have a high school diploma or its equivalent. To be admitted to degree candidacy, the applicant must have completed educational background requirements called Carnegie Units or Secondary School Units. Students are responsible for proof of liability insurance and other requirements specified by the facility providing supervised field experience.

For the Associate in Science degree in Occupational Therapy, a minimum of 65 credits is required.

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GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
 (See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 56 credits

(This includes 12 credits of General Education courses; 3 credits of GWS courses; 6 credits of GS courses; 3 credits of DN courses.)

PRESCRIBED COURSES (56 credits)

BIOL 029 (4), 041 DN(3), 042 (1), ENGL 015 GWS;DEX(3),
 HD FS 129 GS;DE(3), PSY 002 GS(3), O T 101(3), 103(3),
 105(3), 107(3)

HL ED 013 GHS(1), O T 202(2), § 204(3), § 206(3), § 295A(12),
 PSY 243 DS(3), SOC 001 GS(3)

| | |
|---|---|
| X | — |
| — | X |

PHYSICAL THERAPIST ASSISTANCE (2 PTA)

PROFESSOR RICHARD ST. PIERRE, *in charge*

The Physical Therapist Assistance program helps prepare individuals to become skilled technical health workers who assist the physical therapist in patient treatment. Students develop knowledge and skills in the appropriate use of equipment and exercise associated with various physical therapy treatment modalities. In order to accomplish these tasks, the major utilizes a combination of basic science and nonscience course work coupled with health education courses specifically designed for the physical therapist assistant. The program culminates with a full semester of clinical experience.

To enter this major, students must have a high school diploma and satisfactory Scholastic Aptitude Test scores.

The size of each entering class is limited so that optimal clinical experiences and practical application situations can be maintained. Students are admitted into the program only during the fall semester and must progress through the program in the prescribed manner. Clinical affiliations are maintained over a wide geographical area. Students may be required to make special housing and transportation arrangements during the clinical phase.

§A student enrolled in this major must receive a grade of C or better for all of these courses.

For the Associate in Science degree in Physical Therapist Assistance, a minimum of 68 credits is required.

*Scheduling Recommendation
by Semester Standing*

| | | |
|-----|-----|---|
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|-----|-----|---|

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 59 credits

(This includes 12 credits of General Education courses; 6 credits of GWS courses; 3 credits of GN courses; 3 credits of GS courses.)

PRESCRIBED COURSES (59 credits)

| | | | |
|--|---|---|---|
| BIOL 029(4), 041 DN(3), 042(1), ENGL 015 GWS;DEX(3), HL ED 100(3), 270(3), 384(3), § PHYS 001 GN(3) | X | — | — |
| ENGL 202C GWS(3), HL ED 150(2), § 160(2), 250(3), 260(2), 280(3), 303 GHS(3), § PSY 002 GS(3), SPCOM 100A GWS(3) | — | X | — |
| HL ED 395E(4), * 395F(4), * 395G(4)* | — | — | X |

SCIENCE (2SC)

PROFESSOR NORMAN FREED, *in charge*

The Science major is designed primarily to provide for the basic educational needs of students who want to pursue professional programs in various medically related fields. The program provides a fundamental group of science courses of value to those who seek positions in government or industry where such knowledge is necessary or desirable.

The Radiologic Technologist Radiographer option requires seven semesters (five semesters and two summer sessions) of formal classroom and clinical education. In the clinical practicum, the student is required to demonstrate competency in performing examinations under supervision in the radiology department of a participating hospital. This generally requires between 1,800 and 2,400 clock hours. In addition to receiving the Associate in Science degree, the student who successfully completes the major is eligible to take the American Registry of Radiologic Technologists (ARRT) examination for certification.

Graduates of the General option of the Science major may qualify for admission to the baccalaureate degree major in Mathematical Sciences offered at Penn State Harrisburg.

For the Associate in Science degree in Science, a minimum of 66 credits is required.

GENERAL EDUCATION: 21 credits

(12-15 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 57-65 credits

(This includes 12-15 credits of General Education courses. For the Biotechnology option: 3 credits of DN courses; 3 credits of GQ courses; 3 credits of GS courses; 6 credits of GWS courses. For the General and RTR options: 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

COMMON REQUIREMENTS FOR THE MAJOR (ALL OPTIONS): 13 credits

*Courses that include clinical education experiences may require the student to travel long distances or obtain housing near the assigned clinic. Housing and transportation arrangements are the responsibility of the student.

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

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PRESCRIBED COURSES (13 credits)

| | | | | |
|--|---|---|---|---|
| BIOL 011 GN(3), § 012 GN(1), § PHYS 150 DN(3)§ | X | — | — | — |
| ENGL 015 GWS;DEX(3) | X | X | — | — |
| PHYS 151(3)§ | — | X | — | — |

REQUIREMENTS FOR THE OPTION: 44-52 credits

BIOTECHNOLOGY OPTION: 48 credits

PRESCRIBED COURSES (48 credits)

| | | | | |
|--|---|---|---|---|
| CHEM 012 DN(3), 013 DN(3), 014 DN(1), 015 DN(1), ENGL 202C GWS (3), MATH 026 GQ(3), MICRB 201(3), 202(2), STAT GQ(4) | X | — | — | — |
| BIOCH 001 GN(3), CHEM 034(3), 035(3), MICRB 120(4), § 121A(3), § 121B(3), § 231(3), § SOC 005 GS(3) | — | X | — | — |

GENERAL OPTION: 44 credits

PRESCRIBED COURSES (23 credits)

| | | | | |
|--|---|---|---|---|
| BIOL 029(4), CHEM 011(3), MATH 110 GQ(4) | X | — | — | — |
| BIOL 041 DN(3), CMPSC 101 GQ(3), MICRB 106 GN(2), 107 GN(1), SPCOM 100 GWS(3) | — | X | — | — |

ADDITIONAL COURSES (18 credits)

| | | | | |
|---|---|---|---|---|
| MATH 021 GQ or 026 GQ(3) | X | — | — | — |
| CHEM 034 or BIOCH 001 GN(3) | — | X | — | — |
| Select 12 credits from the following biological, mathematical, and physical science courses: | | | | |
| ASTRO 001 GN(3), BIOL 033 DN(3), 042(1), 102 DN(4), BI SC 003 GN(3), CHEM 035(3), 102(3), MATH 111 GQ(2), PHIL 212 GQ(3), PHYS 297(3), or STAT 200 GQ(4) | X | X | — | — |

SUPPORTING COURSES AND RELATED AREAS (3 credits)

| | | | | |
|--|---|---|---|---|
| Select 3 credits from social and behavioral sciences | X | X | — | — |
|--|---|---|---|---|

RADIOLOGIC TECHNOLOGIST RADIOGRAPHER OPTION: 52 credits

PRESCRIBED COURSES (52 credits)

| | | | | |
|---|---|---|---|---|
| BIOL 029(4), 033 DN(3), CHEM 011(3), CMPSC 100(3), HUMAN 101 DH(3), MATH 021 GQ(3), 026 GQ(3), PHYS 297(3), R T R 101(3), § 102(3)§ | X | — | — | — |
| BIOL 041 DN(3), R T R 103(3), § 104(3), § SPCOM 100 GWS (3) | — | X | — | — |
| R T R 105(3), § 106(3)§ | — | — | X | — |
| R T R 107(3)§ | — | — | — | X |

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

SOCIOLOGY (2ESOC)

PROFESSOR JOSEPH FAULKNER, *in charge*

This major introduces students to the study of human groups and their relationships to each other and to the environment. It enables students to gain some proficiency in the scientific study of group structures and processes. A further objective is to help students become more skillful in working with community institutions, agencies, and organizations either through gainful employment or as a volunteer. Graduates may qualify for admission to the baccalaureate degree majors in Behavioral Sciences, Humanities, or Public Policy offered at Penn State Harrisburg.

For the Associate in Arts degree in Sociology, a minimum of 60 credits is required.

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1-2 3-4

GENERAL EDUCATION: 21 credits

(See description of General Education in front of *Bulletin*.)

ELECTIVES: 9 credits

REQUIREMENTS FOR THE MAJOR: 30 credits[§]

PRESCRIBED COURSES (6 credits)

| | | |
|---------------|---|---|
| SOC 001 GS(3) | X | — |
| SOC 007(3) | — | X |

ADDITIONAL COURSES (12 credits)

| | | |
|---|---|---|
| Select 12 credits from SOC 003 GS, 005 GS, 012 DS, 013 DS, 015 DS, 023 DS, 030 DS, 047, 055 DS | X | X |
|---|---|---|

SUPPORTING COURSES AND RELATED AREAS (12 credits)

| | | |
|--|---|---|
| Select 12 credits in arts, humanities, social and behavioral sciences | X | X |
|--|---|---|

SURVEYING TECHNOLOGY (2 SRT)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology
and Commonwealth Engineering, University Park Campus*

PROFESSOR CHARLES GHILANI, *Program Coordinator, Wilkes-Barre Campus*

This major provides the basic undergraduate education required for private and public service as a survey technician in the surveying profession. Basic knowledge is provided in the areas of land, construction, geodetic, photogrammetry, and topographic surveys. Curriculum is designed to develop an individual with an appreciation of the skills and equipment needed to make precise measurements in the field of surveying.

Graduates of the Surveying Technology major may qualify for admission to the baccalaureate degree major in Surveying at the Wilkes-Barre Campus or the Structural Design and Construction Engineering Technology major offered at Penn State Harrisburg.

For the Associate in Engineering Technology degree in Surveying Technology, a minimum of 71 credits is required. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology at each campus where the full two years of the program are offered.

[§]A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

TELECOMMUNICATIONS TECHNOLOGY

Scheduling Recommendation
by Semester Standing
1-2 Summer 3-4

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 62 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

PRESCRIBED COURSES (60 credits)

| | | | |
|---|---|---|---|
| EG T 101(1), 102(1), ENGL 015 GWS;DEX(3), M I S 103(3), MATH 087 GQ(5), 088 GQ(5), PHYS 150 DN(3), SUR 111(3),§ 112(3), 162(3)§ | X | — | — |
| SUR 313(4) | — | X | — |
| CMPSC 101 GQ(3), ENGL 202C GWS(3), PHYS 151 DN(3), SPCOM 101 GWS(3), SUR 211(2), 251(3), 272(3),§ 321(3), 372W(3) | — | — | X |

ADDITIONAL COURSES (2 credits)

Select 2 credits from the following technical courses:

| | | | |
|--|---|---|---|
| CE T 261, 297, CHEM 012 DN, FOR 203, MATH 140 GQ, 141 GQ, 231, S T S 200 GS;DE, SUR 331, 351, 362, 375, 385, 497 | — | — | X |
|--|---|---|---|

TELECOMMUNICATIONS TECHNOLOGY (2TELT)

PROFESSOR WAYNE HAGER, *Head, School of Engineering Technology
and Commonwealth Engineering, University Park Campus*
PROFESSOR HAROLD GROFF, *Program Coordinator, Wilkes-Barre Campus*

The field of telecommunications includes the transmission of voice and digital signals by telephone, telegraph, radio, television, and satellite. Graduates of the Telecommunications Technology major can become engineering technicians who help select, design, install, operate, maintain, troubleshoot, and repair modern telecommunications systems. Future uses for telecommunications systems include electronic mail, electronic shopping, home computer terminal tie-ins, remote utility meter reading, and the transmission of biomedical data between hospitals, libraries, and doctors' offices.

Graduates of the Telecommunications Technology major may qualify for admission to the baccalaureate degree major in Electrical Engineering Technology offered at Penn State Harrisburg or Penn State Erie, The Behrend College.

For the Associate in Engineering Technology degree in Telecommunications Technology, a minimum of 72 credits is required.

GENERAL EDUCATION: 21 credits

(12 of these 21 credits are included in the REQUIREMENTS FOR THE MAJOR)
(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 63-65 credits

(This includes 12 credits of General Education courses; 3 credits of DN courses; 3 credits of GQ courses; 6 credits of GWS courses.)

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

WILDLIFE TECHNOLOGY

*Scheduling Recommendation
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1-2 3-4

PREScribed COURSES (62 credits)

CMPSC 101 GQ(3), EE T 101(3), 109(1), 114(3), 118(1),
205(1), 210(3), EG T 101(1), 102(1), ENGL 015 GWS;DEX(3),
ENGR 002(1), MATH 087 GQ(5), 088 GQ(5),
TELCM 140(2)

X —

EE T 117(3), 120(1), 211(4), § 216(3), 221(1), PHYS 150 DN(3),
151(3), SPCOM 100 GWS(3), TELCM 241(3), 242(1),
243(3), § 244(1)

— X

ADDITIONAL COURSES (1-3)

Select 1-3 courses from the following technical courses:

BE T 297, CE T 261, CMPSC 102, EE T 211, 213, 297,
EG T 201, IE 315, MCH T 111, ME T 207

— X

WILDLIFE TECHNOLOGY (2 WLT)

PROFESSOR MICHAEL J. LACKI, *in charge*

The Wildlife Technology major helps prepare students in the techniques of wildlife management. Personnel trained in this field are needed to assist in the applied phases of natural resource management, wildlife biology, range management, and the care, maintenance, and propagation of animals. Graduates should be able to support professionals in wildlife biology, park managers, game refuge managers, and laboratory technicians in research.

For the Associate in Science degree in Wildlife Technology, a minimum of 65 credits is required.

*Scheduling Recommendation
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1-2 3-4

GENERAL EDUCATION: 21 credits

(See description of General Education in front of *Bulletin*.)

REQUIREMENTS FOR THE MAJOR: 44 credits

PREScribed COURSES (44 credits)

SUR 162(2), FOR 240(3), 250(3), WILDL 101(3), §
103(3), § 106(4)

X —

AG 113(1), FOR 242(3), HL ED 013 GHS(1),
WILDL 204(4), 207(3), 208(3), § 209(4),
211(4), 213(3)

— X

§A student enrolled in this major must receive a grade of C or better, as specified in Senate Policy 82-44.

COURSE DESCRIPTIONS

CREDITS AND HOURS

Credits are awarded on the semester-hour basis. According to Senate Policy 42-23, a total of at least forty hours of work planned and arranged by the University faculty is required for the average student to gain 1 credit. While the distribution of time varies from course to course, generally, one-third of the time is devoted to formal instruction, such as lecture, recitation, laboratory, field trips, etc., and two-thirds of the time to outside preparation.

Credits, classroom work, and practicum or laboratory work are indicated by three numbers in parentheses immediately following the course title—for example (3:3:0):

1. The first number shows the maximum credits authorized for the course.
2. The second number shows the periods of classroom work (including lecture, recitation, class discussion, demonstration, or various combinations of these).
3. The third number shows the periods of practicum work (including laboratory, shop work, studio, drafting room, field trips, etc.).

A typical class period is fifty minutes.

Courses numbered from 1 to 399 carry baccalaureate credit and are required in most of the associate degree majors. Elective credit courses vary from campus to campus and semester to semester, and all of the courses listed here are not offered at each campus. Students can obtain information about the specific course offerings for a given campus from the appropriate *Schedule of Classes*. Descriptions of prerequisite courses listed here by number only may be found in the *Baccalaureate Degree Programs Bulletin*.

COURSE SUFFIXES

GENERAL EDUCATION—The following suffixes are used in the course description section to designate courses that have been approved for General Education:

Skills Courses

- Writing/Speaking—GWS
- Quantification—GQ
- Health Sciences—GHS
- Physical Education—GPE

Breadth Courses

- Natural Sciences—GN
- Arts—GA
- Humanities—GH
- Social and Behavioral Sciences—GS6

Depth Courses

- Natural Sciences—DN
- Arts—DA
- Humanities—DH
- Social and Behavioral Sciences—DS

CULTURAL DIVERSITY—The following suffixes are used in the course description section to designate courses that have been approved to help fulfill the cultural diversity requirement for baccalaureate degree students: DF—diversity focused; DE—diversity enhanced; and DEX—diversity enhanced by section.

WRITING ACROSS THE CURRICULUM—Courses with a W suffix may be used toward fulfilling this requirement.

ACCOUNTING (ACCTG)

150. INTERMEDIATE ACCOUNTING (3:3:0) Financial accounting statements, concepts, and procedures; assets, liabilities, owners' equity, statement analysis. Students may not receive credit for both ACCTG 150 and 471. Prerequisite: ACCTG 200.

AFRICAN/AFRICAN AMERICAN STUDIES

160. COST ACCOUNTING (3:3:0) Use of standard cost accounting procedures to present cost and budget statements as a means of providing managerial control. Students may not receive credit for both ACCTG 160 and 404. Prerequisite: ACCTG 200.

170. NOT FOR PROFIT ACCOUNTING (3:3:0) Accounting procedures designed to meet the environmental characteristics of nonprofit and governmental entities. Prerequisite: ACCTG 200.

186. FEDERAL TAX ACCOUNTING (3:3:0) Tax planning and compliance with federal income tax rules and regulations, especially those affecting individuals.

200. INTRODUCTORY FINANCIAL ACCOUNTING (3:2¹/₂:1) Fundamentals of the collection, recording, summarization, and interpretation of accounting data.

204. INTRODUCTORY MANAGERIAL ACCOUNTING (3:2¹/₂:1) Actual and standard cost systems; managerial uses of cost data. Prerequisite: ACCTG 200.

AFRICAN/AFRICAN AMERICAN STUDIES (AAA S)

100. (DS;DF) EVOLVING STATUS OF BLACKS IN THE TWENTIETH CENTURY: INTERDISCIPLINARY PERSPECTIVES (3:3:0) An interdisciplinary team-taught exploration of the evolving status of Black Americans in the twentieth century. Emphasis on the civil rights movement.

145. (RL ST) (DH;DF) AFRO-AMERICAN RELIGION (3:3:0) History and significance of the religious dimension from enslavement to the civil rights movement and contemporary churches and sects.

146. (RL ST) (DH;DF) THE LIFE AND THOUGHT OF MARTIN LUTHER KING, JR. (3:3:0) A survey of the civil rights leader, including his religious beliefs, intellectual development, and philosophy for social change.

187. AFRICAN/AFRICAN AMERICAN STUDIES FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

AGRICULTURAL ECONOMICS (AG EC)

101. (DS) INTRODUCTION TO AGRICULTURAL ECONOMICS (3:3:0) Application of economic principles to resource allocation problems in the production, marketing, and consumption of food and agricultural products. Not open to students in the Agricultural Economics and Rural Sociology or Agricultural Business Management majors or students who have completed ECON 302 DS.

102. INTRODUCTION TO FOOD AND AGRICULTURAL MARKETING (3:3:0) Comprehensive theoretical and descriptive survey of farm and food products marketing from the perspective of producers, marketing middlemen, and consumers.

106. INTRODUCTION TO FARM MANAGEMENT (3:3:0) Organizing and operating farm businesses for financial success; measuring profits; improving efficiency of labor, land, capital; getting started in farming.

200. INTRODUCTION TO AGRICULTURAL BUSINESS MANAGEMENT (3:3:0) Application of management principles and processes to agricultural business firms in their planning and operating in domestic and international markets.

208. FARM RECORDS AND ACCOUNTS (3:2:2) Practice in keeping, analyzing, interpreting records; systems of accounts to meet needs of individual farm situations.

232. MARKETING DAIRY PRODUCTS (3:3:0) Economics of marketing dairy products; factors affecting price, production, and utilization of milk; role of cooperatives; price plans and policies.

297. SPÉCIAL TOPICS (1-9)

AGRICULTURAL SYSTEMS MANAGEMENT (A S M)

101. MECHANIZATION PRINCIPLES OF PRODUCTION AGRICULTURE (3:2:2) Applying engineering and mechanization principles for selection and application of agricultural equipment, structural environmental control, and soil and water conservation.

206. AGRICULTURAL BUILDING PRACTICES AND MATERIALS (4:2:4) Hand and power tool use, carpentry, concrete, masonry, tool-fitting skills, building materials, and construction procedures in agricultural applications.

AGRICULTURE—GENERAL (AG)

113. EXPLORING CAREERS IN AGRICULTURE (1:1:0) Examination of career opportunities in agriculture with an exploration of the relationship between student interest and career decisions.

AGRONOMY (AGRO)

028. PRINCIPLES OF CROP MANAGEMENT (3:2:2) Biological and agronomic principles applied to production and management of major feed and forage crops of the northeastern United States. Prerequisites: 6 credits in biological science.

AMERICAN STUDIES (AM ST)

100. (GH) INTRODUCTION TO AMERICAN STUDIES (3:3:0) A study of selected attempts to identify and interpret movements and patterns in American culture. Prerequisite: third-semester standing.

105. (DH;DF) AMERICAN POPULAR CULTURE AND FOLKLIFE (3:3:0) Survey of popular culture, folklife, and ethnicity, synthesizing material from such areas as literature, media, entertainment, print, music, and film.

187. AMERICAN STUDIES FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

193. (ENGL) AMERICAN FOLK SONG IN ENGLISH (3:3:0) British songs in America; native repertoires, white and black; folk ballad; and musical development.

196. (ENGL) INTRODUCTION TO AMERICAN FOLKLORE (3:3:0) A basic introduction to verbal and nonverbal folklore stressing the basic procedures of collection, classification, and analysis.

ANIMAL SCIENCE (AN SC)

007. HORSE PRODUCTION AND MANAGEMENT (3:2:2) Principles of selection, breeding, feeding, management, and marketing of horses; emphasis on light leg horses.

100. ANIMAL AGRICULTURE (3:2:2) Magnitude, importance, and complexity of the beef, dairy, horse, poultry, sheep, and swine industries, with particular emphasis on Pennsylvania agriculture.

201. MEAT ANIMAL MANAGEMENT (3:3:0) Principles of nutrition, breeding, physiology, health, and marketing applied to improving the performance and efficiency of meat production. Not intended for animal production majors.

202. DAIRY SCIENCE AND INDUSTRY (3:2:2) Introduction to dairy industry; milk composition, production, marketing. Dairy cattle breeding, feeding, housing, husbandry, management, and selection. Intended for non-dairy production majors.

ANTHROPOLOGY (ANTH)

001. (GS) INTRODUCTORY ANTHROPOLOGY (3:3:0) Prehistoric and traditional peoples and cultures; traditional customs and institutions compared with those of modern society.

002. (GS) INTRODUCTION TO ARCHAEOLOGY (3:3:0) This course surveys basic approaches used by archaeologists to interpret prehistoric human cultural patterns.

008. (DS;DF) AZTECS, MAYAS, AND INCAS (3:3:0) Comparative survey of the development of the pre-Columbian Latin American civilizations.

009. (DS) RISE OF CIVILIZATION IN THE OLD WORLD (3:3:0) Evolution of Old World complex societies, especially the first great civilizations of Mesopotamia, Egypt, China, and the Indus Valley.

011. (DS;DF) INTRODUCTORY NORTH AMERICAN ARCHAEOLOGY (3:3:0) Introduction to archaeology of the North American Indians; site methods, and results of research interpreted in cultural history.

021. (GN) INTRODUCTORY BIOLOGICAL ANTHROPOLOGY (3:3:0) The role of human biology and evolution in culture, society, and behavior.

045. (GS) CULTURAL ANTHROPOLOGY (3:3:0) Beginnings of human culture; economic life, society, government, religion, and art among traditional peoples.

146. (DS;DF) NORTH AMERICAN INDIANS (3:3:0) An introduction to the cultures of the indigenous peoples of North America, north of Mexico, and the effect of contact.

187. ANTHROPOLOGY FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

ARABIC (ARAB)

001. ELEMENTARY MODERN STANDARD ARABIC I (4:3:2) Introduction to reading, writing, pronunciation, and aural comprehension of modern standard Arabic; simple grammatical forms; basic vocabulary.

ARCHITECTURAL ENGINEERING TECHNOLOGY

002. ELEMENTARY MODERN STANDARD ARABIC II (4:3:2) Continued audio-lingual practice in class and language laboratory of modern standard Arabic; continuation of grammar and vocabulary building. Prerequisite: ARAB 001.

003. INTERMEDIATE MODERN STANDARD ARABIC (4:3:2) Continued audio-lingual practice in class and language laboratory of modern standard Arabic; complex grammatical forms, vocabulary building principles. Prerequisite: ARAB 002.

187. ARABIC FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

296. INDEPENDENT STUDIES (1-18)

297. SPECIAL TOPICS (1-9)

ARCHITECTURAL ENGINEERING TECHNOLOGY (AE T)

101. BUILDING MATERIALS (3:3:0) Structural and architectural use of building materials and construction assemblies.

102. METHODS OF CONSTRUCTION (3:1:5) Materials and methods of construction used in buildings, as expressed in drawings. Prerequisite or concurrent: AE T 101, EG T 101 and 102.

103. PLUMBING AND FIRE PROTECTION (3:2:2) Layout of plumbing and fire protection in buildings to meet code and usage requirements. Prerequisite or concurrent: AE T 102.

113. SITE PLANNING (2:1:2) Energy conservation through optimum site utilization, contours, cut and fill calculations, storm drainage, spot grading, and finish grading.

121. INTRODUCTION TO BUILDING ENVIRONMENTAL SYSTEMS (2:1:2) Introduction to building environmental systems technology terminology, concepts, and the design process.

204. HEATING, VENTILATING, AND AIR CONDITIONING LAYOUT (3:2:2) Fundamental calculations and layout of systems in buildings. Prerequisite: AE T 103. Prerequisite or concurrent: AE T 102.

206. ARCHITECTURAL PRESENTATION (2:1:2) Visual communication through architectural presentation drawings. Line, value, color, and composition. Prerequisite: E G 001 or 003.

207. ADVANCED CONSTRUCTION METHODS (3:1:5) Integration of materials and systems in working drawings. Prerequisite: fourth-semester standing.

209. STRUCTURE DESIGN (3:2:3) Elementary principles of structural design and detailing in timber, steel, and reinforced concrete; use of handbooks; fundamentals of structural and architectural drafting. Prerequisites: AE T 102, MCH T 213, or EG T 201.

210. ARCHITECTURAL ENGINEERING OFFICE PRACTICE (3:3:0) Procedures involved in production of contract documents, both drawings and specifications. Prerequisite: fourth-semester standing.

210W. ARCHITECTURAL ENGINEERING OFFICE PRACTICE USING WRITING SKILLS (3:3:0) Concepts, procedures, and writing-intensive activities to properly prepare site observation reports, cost estimates, contractual conditions, and outline and technical specifications. Prerequisite: fourth-semester standing.

212. BUILDING LIGHTING AND ELECTRICAL LAYOUT (3:2:2) Layout of lighting and electrical distribution in buildings.

214. STEEL CONSTRUCTION (3:2:2) Strength of materials as applied to the design of simple steel structures. Prerequisites: AE T 102, MCH T 111.

215. CONCRETE CONSTRUCTION (3:2:2) Fundamentals of design and construction of reinforced concrete structures. Prerequisites: AE T 102, MCH T 111.

227. LIQUID HEATING AND COOLING SYSTEMS (3:2:2) Water, steam, and refrigerant systems and components; pumps and piping; heat exchangers; fluid and component selection; power and controls. Prerequisites: AE T 121, ME T 281.

228. AIR HEATING, COOLING, AND VENTILATING SYSTEMS (3:2:2) Air systems and distribution components; fans and ductwork; heat exchange coils, dampers and controls; residential fired equipment operation. Prerequisite: AE T 227.

229. ANALYSIS OF BUILDING ENVIRONMENTAL SYSTEMS (3:1:5) Comprehensive analysis and application of building environmental systems with focus on selected areas; calculation and layout; computer modeling of systems. Prerequisite: fourth-semester standing.

297. SPECIAL TOPICS (1-9)

ART (ART)

001. (GA) THE VISUAL ARTS AND THE STUDIO: AN INTRODUCTION (3:3:0) Introduction to the visual arts; the practice of the visual arts; social, cultural, and aesthetic implications of studio activity.

100. (GA) CONCEPTS AND CREATION IN THE VISUAL ARTS (3:1:4) A study of the personal and cultural foundations of artistic creation and practice of creative production in the art studio.
110. IDEAS AS VISUAL IMAGES (3:2:4) Introduction to relationships between visual images and ideas from which they are derived; visual languages, organizational systems, and contextual associations.
111. IDEAS AS OBJECTS (3:2:4) Introduction to the relationship between ideas and the creation of three-dimensional objects.
120. BEGINNING DRAWING (3:2:4) The study and practice of basic drawing as a way of understanding and communicating.
130. (DA) INTRODUCTION TO SCULPTURE I (3:2:4) An introduction to sculpture consisting of lectures, demonstrations, and basic studio work coordinated to cover a broad range of processes.
215. (DA) INTRODUCTORY FIBER ARTS (3:1:5) Theory development and introduction to fiber arts, with emphasis on the loom and nonloom textile art processes.
217. (DA) BEGINNING METAL ARTS (3:2:4) Introduction to fundamental jewelry-making and small-scale metalsmithing processes, including conceptualization, fabrication, surface treatment, and finishing of metalwork. Prerequisites: ART 110, 111, 120, 122W.
223. DRAWING: TECHNIQUES, MATERIALS, AND TOOLS (3:2:4) Drawing with an emphasis on organization and the development of drawing skills through a variety of techniques, materials, and tools. Prerequisites: ART 110, 111, 120, 122W.
240. BEGINNING PRINTMAKING: INTAGLIO (3:2:4) Instruction and practice in the fundamentals of the intaglio process; its relationship to the design and meaning of the print. Prerequisites: ART 110, 111, 120, 122W.
241. BEGINNING PRINTMAKING: LITHOGRAPHY (3:2:4) Instruction and practice in the fundamentals of the lithographic process; its relationship to the design and meaning of the print. Prerequisites: ART 110, 111, 120, 122W.
250. BEGINNING OIL PAINTING (3:2:4) The materials and techniques of painting in oil and their uses in creative painting on panels and canvas. Prerequisites: ART 110, 111, 120, 122W.
251. ACRYLIC PAINTING (3:2:4) Introduction to the materials and techniques of creative painting with acrylic paints.
260. BEGINNING WATERCOLOR PAINTING (3:2:4) Transparent watercolor painting on various papers; knowledge of materials, development of skills and creativity. Prerequisites: ART 110, 111, 120, 122W.
270. (DA) BEGINNING GRAPHIC DESIGN (3:2:4) Orientation to graphic design and the methods of the designer; experimentation in language and visual symbolism in communication of ideas.
280. BEGINNING CERAMICS (3:2:4) The fundamentals of ceramics, throwing, hand building, and glazing; acquainting the student with ceramic materials, techniques, and philosophy. Prerequisites: ART 110, 111, 120, 122W.
290. (DA) BEGINNING PHOTOGRAPHY (3:2:4) Fundamental black-white techniques. Introduction to inherent qualities of photographic vision through study of historic/contemporary photography. Camera, light meter required.
296. INDEPENDENT STUDIES (1-18)

ART EDUCATION (A ED)

303. THE VISUAL ARTS IN THE ELEMENTARY SCHOOL (3:2:2) Understanding of children's art; development of some confidence in the student's own creative approach in the visual arts.

ART HISTORY (ART H)

100. (GA) INTRODUCTION TO ART (3:3:0) An approach to the understanding of art through a critical analysis of selected works of architecture, painting, and sculpture. Students who have passed ART H 110 may not schedule this course.
110. SURVEY OF WESTERN ART (3:3:0) General survey of major developments in architecture, painting, and sculpture in the Western world. Students who have passed ART H 100 GA may not schedule this course.
111. (GA) SURVEY OF WESTERN ART I (3:3:0) Survey of the major monuments and trends in the history of art from prehistory through the late Gothic period. Students who have passed ART H 110 may not schedule this course.
112. (GA) SURVEY OF WESTERN ART II (3:3:0) Survey of the major monuments and trends in the history of art from the Renaissance to the modern era. Students who have passed ART H 110 may not schedule this course.
120. (GA;DF) SURVEY OF EASTERN ART (3:3:0) A general survey of the great periods of art in India, Central Asia, China, Japan, and the Islamic world.
211. (DA) ANCIENT ARCHITECTURE (3:3:0) Architecture of Egypt, the Ancient Near East, Greece, and Rome.

THE ARTS

212. (DA) MEDIEVAL ARCHITECTURE (3:3:0) Architecture of the Christian church from its origin until the Renaissance, with special attention to medieval construction and design.
213. (DA) RENAISSANCE-BAROQUE ARCHITECTURE (3:3:0) Survey of architecture from the fifteenth through the eighteenth century in Western Europe.
214. (DA) MODERN ARCHITECTURE (3:3:0) Architecture and related arts of sculpture and painting from the end of the eighteenth century to the present.
301. (DA) EGYPTIAN AND MESOPOTAMIAN ART (3:3:0) Art of the Ancient Near East, including Egypt, Mesopotamia, and neighboring civilizations.
303. (DA) ITALIAN RENAISSANCE ART (3:3:0) The major arts in Italy from the thirteenth century A.D. through the Renaissance; emphasis on sculpture and painting.
304. (DA) SOUTHERN BAROQUE PAINTING (3:3:0) Seventeenth-century painting in Italy, France, and Spain. Emphasis will be on Italy as the vanguard country.
305. (DA) EUROPEAN ART FROM 1780-1860 (3:3:0) A survey of painting and sculpture in Europe from the beginnings of Neoclassicism through the Realist movement. Prerequisite: ART H 100 GA, 110, or 112 GA.
306. (DA) ENGLISH ART (3:3:0) Survey of English art, emphasizing the Middle Ages and the eighteenth and early nineteenth centuries.
307. (DA) AMERICAN ART (3:3:0) History of art in the English colonies and the United States from the seventeenth century to the present.
311. (DA) GREEK AND ROMAN ART (3:3:0) Greek and Roman art, with emphasis on painting and sculpture.
312. (DA) ROMANESQUE AND GOTHIC ART (3:3:0) Survey of the architecture, sculpture, and painting of the Christian church in western Europe from 1000 to 1500.
313. (DA) NORTHERN RENAISSANCE ART (3:3:0) Art in northern Europe in the fifteenth and sixteenth centuries, emphasizing painters such as Van Eyck, Dürer, and Bruegel.
314. (DA) ART IN THE AGE OF REMBRANDT (3:3:0) Dutch and Flemish painting in the seventeenth century.
320. (DA;DF) CHINESE ART (3:3:0) A general survey of the great periods of Chinese art from the Shang dynasty until the modern period.
324. (DA) ROCOCO ART (3:3:0) Eighteenth-century art in western Europe, with emphasis on artists such as Watteau, Fragonard, Falconet, Le Gros, Tiepolo, Guardi, Neumann.
325. (DA) MODERN ART IN EUROPE: SURVEY FROM IMPRESSIONISM TO SURREALISM (3:3:0) A survey of European painting and sculpture from ca. 1850 to ca. 1940. Prerequisite: ART H 100 GA, 110, or 112 GA.
330. (DA) ISLAMIC ART (3:3:0) Survey of the art and architecture of Islamic lands from the late seventh century until the eighteenth century.
342. (DA) RUSSIAN ART AND ARCHITECTURE (3:3:0) Survey of Russian art and architecture from the foundation of the Russian state through the Soviet era.

THE ARTS (ARTS)

001. (GA) THE ARTS (3:3:0) Develop critical perception, knowledge, and judgments through an examination of the basic concepts common among the arts.
005. (GA) PERFORMING ARTS (3:2:3) Introduction to music, dance, and theatre. Orientation to the aesthetics, theory, and practice of professional performance.
296. INDEPENDENT STUDIES (1-18)

ASTRONOMY AND ASTROPHYSICS (ASTRO)

001. (GN) ASTRONOMICAL UNIVERSE (3:3:0) Nonmathematical description of the astronomical universe and the development of scientific thought. For nonscience majors. Students who have passed ASTRO 090 GN may not schedule this course.
- * 010. (GN) ELEMENTARY ASTRONOMY (2:2:0) Nonmathematical description of stars, planets, galaxies, and the universe. For nonscience majors. Students who have passed ASTRO 001 GN or 090 GN may not schedule this course.
- * 011. (GN) ELEMENTARY ASTRONOMY LABORATORY (1:0:2) Selected experiments and data analysis to illustrate major astronomical principles and techniques. Telescopic observations of stars and galaxies. For non-science majors. Prerequisite or concurrent: ASTRO 001 GN or 010 GN.
291. (DN) ASTRONOMY OF THE SOLAR SYSTEM (3:3:0) Methods and instruments of the astronomer and results obtained by applying them to our solar system. Prerequisite or concurrent: MATH 140 GQ.

* Students must take a combination of ASTRO 010 GN and 011 GN in order to obtain General Education credits in astronomy.

292. (DN) ASTRONOMY OF STELLAR SYSTEMS (3:3:0) Methods of study and knowledge of the universe beyond the limits of the solar system. Prerequisites or concurrent: MATH 140 GQ.

BIOLOGICAL SCIENCE (BI SC)

001. (GN) STRUCTURE AND FUNCTION OF ORGANISMS (3:3:0) Origin, development, and cellular basis of life; fundamental principles, processes, and structures of organisms. Students who have passed BIOL 027, 041 DN, 101 DN, or 102 DN may not schedule this course.

002. (GN) GENETICS, ECOLOGY, AND EVOLUTION (3:3:0) How living organisms pass on their inheritance, how plants and animals came to be what they are, and how they now react. Students who have passed BIOL 033 DN, 101 DN, 102 DN, or 222 may not schedule this course.

003. (GN) ENVIRONMENTAL SCIENCE (3:3:0) Kinds of environments; past and present uses and abuses of natural resources; disposal of human wastes; prospects for the future. Students who have passed BIOL 210 or any other upper-level ecology course in biology may not schedule this course.

004. (GN) HUMAN BODY: FORM AND FUNCTION (3:3:0) A general survey of structure and function—from conception, through growth and reproduction, to death. Students who have passed BIOL 029 and 041 DN may not schedule this course.

BIOLOGY (BIOL)

027. (GN) INTRODUCTION TO PLANT BIOLOGY (3:2:2) Cellular structure and organization; physiological processes; classification; reproduction and development; relationship of plant groups. Students who have passed BIOL 102 DN may not schedule this course.

029. MAMMALIAN ANATOMY (4:2:4) Anatomy of a mammal, with special reference to that of man. Students who have passed BIOL 421 may not schedule this course.

033. (DN) GENETICS AND EVOLUTION OF THE HUMAN SPECIES (3:3:0) Human heredity and evolution, individual and social implications. Students who have passed BIOL 472 may not schedule this course.

041. (DN) PHYSIOLOGY (3:3:0) Normal functions of the animal body, with special reference to those of man. Students who have passed BIOL 472 may not schedule this course.

042. PHYSIOLOGY LABORATORY (1:0:2) Experiments demonstrating basic physiological principles, with special reference to humans. Prerequisite or concurrent: BIOL 041 DN.

110. (DN) BASIC CONCEPTS AND BIODIVERSITY (4:3:2) A study of the evolution of the major groups of organisms including the fundamental concepts of biology.

220W. (DN) POPULATIONS AND COMMUNITIES (4:3:2) A study of the structures and functions of organismic interactions from simple populations to complex ecosystems. Prerequisite: BIOL 110 DN.

230W. (DN) MOLECULES AND CELLS (4:3:2) A study of cellular phenomena, including molecular genetics and metabolic interactions. Prerequisites: BIOL 110 DN, CHEM 012 DN.

231. (MICRB) CELL BIOLOGY (3:3:0) Fundamental cellular, subcellular, and molecular characteristics of cells. Prerequisites: BIOL 101 DN, CHEM 012 DN.

240W. (DN) FUNCTION AND DEVELOPMENT OF ORGANISMS (4:3:2) A study of development and physiological processes at the organismic level. Prerequisites: BIOL 110 DN, CHEM 012 DN.

BIOMEDICAL EQUIPMENT TECHNOLOGY (BE T)

201. PHYSIOLOGICAL TRANSDUCERS (5:4:2) Study of the principles of operation and applications of devices used for the conversion of physiological events to electrical signals. Prerequisite: EE T 114.

202. BIOMEDICAL INSTRUMENTATION AND SYSTEMS (5:4:2) Introduction to the operating principles, maintenance, and analytic troubleshooting of electronic, fluid, and pneumatic biomedical equipment. Prerequisite: BE T 201.

203. BIOMEDICAL EQUIPMENT LABORATORY (Internship) (4:1:6) Practical experience, within or related to the hospital environment, on a variety of biomedical instruments. Prerequisites: BE T 204, BIOL 041 DN.

204. MEDICAL AND CLINICAL EQUIPMENT (3:2:2) Principles of operation of clinical, medical radiography, intensive care, anesthesia, respiratory, noninvasive imaging, and emergency equipment; hospital electrical safety. Prerequisite: BE T 201.

205. HIGH-POWER MEDICAL EQUIPMENT (3:2:2) A study of high-power medical instrumentation using lumped-element p-n junction devices, crystals, and lasers. Prerequisite: EE T 114.

297. SPECIAL TOPICS (1-9)

BUSINESS ADMINISTRATION (B A)

100. INTRODUCTION TO BUSINESS (3:3:0) A comprehensive view of the contemporary environment of business.

195. COOPERATIVE PRACTICUM WITH BUSINESS OFFICES (3-6) Cooperative practical work with business offices under the supervision of the instructor.

250. PROBLEMS OF SMALL BUSINESS (3:3:0) Analysis of problems of the small firm, particularly for the student who wishes to venture into business. Prerequisite: 3 credits in economics.

BUSINESS LAW (B LAW)

243. LEGAL ENVIRONMENT OF BUSINESS (3:3:0) Social control through law: courts, basic policies underlying individual and contractual rights in everyday society. Prerequisite: third-semester standing.

BUSINESS LOGISTICS (B LOG)

301. BUSINESS LOGISTICS MANAGEMENT (3:3:0) Management of logistics function in firm, including physical supply and distribution activities such as transportation, storage facility location, and materials handling. Prerequisite: third-semester standing.

304. TRANSPORT SYSTEMS (3:3:0) Conceptual model of a transport system; environmental relationships; modal components and managerial conditions, with special application to the United States.

305. TRAFFIC MANAGEMENT (3:3:0) Analysis of traffic function in the logistics system. Evaluation of routes, rates, and shipping document procedures. Prerequisite: B LOG 301 or 304.

CHEMISTRY (CHEM)

001. (GN) MOLECULAR SCIENCE (3:3:0) Selected concepts and topics in chemistry and related physical sciences showing their development, interrelationship, and present status. Students who have received credit for CHEM 002, 011 GN, or 012 DN may not schedule this course.

011. INTRODUCTORY CHEMISTRY (3:2:2) Selected principles and applications of chemistry. Prior study of chemistry not assumed.

012. (DN) CHEMICAL PRINCIPLES (3-4) Basic concepts and quantitative relations. Prerequisite: Satisfactory performance on placement examination—students take CHEM 012 DN for 3 credits. Unsatisfactory performance on placement examination—students take either CHEM 012 DN for 4 credits or CHEM 011 or 017 DN as directed on FTCAP profile.

013. (DN) CHEMICAL PRINCIPLES (3:3:0) Continuation of CHEM 012 DN, including introduction to the chemistry of the elements. Prerequisite: CHEM 012 DN or 017 DN. Prerequisite or concurrent: CHEM 014 DN.

014. (DN) EXPERIMENTAL CHEMISTRY (1:0:3) Introduction to quantitative experimentation in chemistry. Prerequisite or concurrent: CHEM 012 DN or 017 DN.

015. (DN) EXPERIMENTAL CHEMISTRY (1:0:3) Continuation of CHEM 014 DN, with emphasis on analytical procedures. Prerequisite: CHEM 014 DN. Prerequisite or concurrent: CHEM 013 DN.

017. (DN) INTRODUCTORY AND GENERAL CHEMISTRY (5:5:2) Introductory and general chemistry for students who are required to take additional chemistry, e.g., CHEM 013 DN, but are unprepared for CHEM 012 DN. Students may not receive credit for both CHEM 017 DN and CHEM 011 or 012 DN.

023. INTRODUCTION TO MODERN ANALYTICAL CHEMISTRY (4:2:4) Contemporary methods of chemical and instrumental analysis, including potentiometric titration, specific ion electrodes, spectrophotometry, and chromatography. Prerequisite: CHEM 015 DN.

034. ORGANIC CHEMISTRY (3:3:0) Introduction to organic chemistry, with emphasis on the properties of organic compounds of biochemical importance. Not open to those who have previously scheduled CHEM 037. Prerequisite: CHEM 011, 012 DN, or 017 DN.

035. ORGANIC CHEMISTRY (3:2:4) Introduction to organic chemistry, with emphasis on the identification of organic compounds by characteristic chemical reactions and by spectroscopy. Prerequisite: CHEM 034.

036. LABORATORY IN ORGANIC CHEMISTRY (2:0:6) Basic laboratory operations; applications of theories and principles. Prerequisite: CHEM 038. Prerequisite or concurrent: CHEM 039 or 040.

037. ORGANIC CHEMISTRY (3:3:0) Introduction to organic chemistry, with emphasis on topics of particular relevance to mineral science, materials science, and engineering. Not open to those who have previously scheduled CHEM 034. Prerequisite: CHEM 011 or 012 DN.

038. ORGANIC CHEMISTRY (4:4:0) Principles and theories; nomenclature; chemistry of the functional groups; applications of spectroscopy. Students may not receive credit for both CHEM 038 and 034. Prerequisite: CHEM 013 DN.

039. ORGANIC CHEMISTRY (3:3:0) Continuation of CHEM 038. Emphasis is placed on the role of organic reactions in biological chemistry. Students may not receive credit for both CHEM 039 and 040. Prerequisite: CHEM 038.

040. ORGANIC CHEMISTRY (2:2:0) Continuation of CHEM 038 to include especially polyfunctional organic molecules. Student may not receive credit for both CHEM 039 and 040. Prerequisite: CHEM 038.

102. ENVIRONMENTAL CHEMISTRY (3:3:0) Applications of chemistry to environmental problems, including air, water, thermal pollution; pesticides; drugs and birth control agents; food additives; etc. For nonchemistry majors; chemistry majors will not receive credit.

389. SPECIAL PROBLEMS AND RESEARCH (1-4 per semester, maximum of 12) Designed for freshman or sophomore students who are prepared to undertake special problems and research by arrangement with a faculty member.

395. CHEMISTRY TEACHER ASSISTANT TRAINING (1-2) Instruction and practice in the role of the teaching assistant in the undergraduate chemistry laboratory.

CHINESE (CHNS)

001. ELEMENTARY CHINESE I (4:3:2) Introductory study of Chinese language, with audio-lingual practice of Mandarin Chinese and attention to structure and the writing system.

002. ELEMENTARY CHINESE II (4:3:2) Continued audio-lingual practice of Mandarin Chinese, further study of structure, practice in reading and writing Chinese. Prerequisite: CHNS 001.

003. INTERMEDIATE CHINESE (4:3:3) Continued audio-lingual practice of Mandarin Chinese, more extensive practice in reading and writing; study of Chinese culture. Prerequisite: CHNS 002.

004. INTERMEDIATE CHINESE (3:3:0) Readings in selected modern Chinese literature (short stories, plays, essays, and poems). Practice in simple composition. Prerequisite: CHNS 003.

110. CONVERSATION, READING, AND COMPOSITION (3:3:0) Readings in selected modern Chinese literature (short stories, plays, essays, poems) and other texts; practice in conversation and simple composition. Prerequisite: CHNS 003.

187. CHINESE FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

199. FOREIGN STUDY—BASIC CHINESE (1-8) Small-group instruction in spoken and written Mandarin at the introductory level.

296. INDEPENDENT STUDIES (1-18)

297. SPECIAL TOPICS (1-9)

299. (DF) FOREIGN STUDY—INTERMEDIATE CHINESE (3-12) Small-group instruction in spoken and written Mandarin at the intermediate level. Prerequisite: CHNS 002.

CIVIL ENGINEERING TECHNOLOGY CE T)

216. SPECIAL SURVEYS (3:1:4) Applications of surveying in hydrography, mining, construction, and subdivision planning; surveying registration law and professional ethics. Prerequisites: SUR 112, 113.

217. CARTOGRAPHIC TECHNIQUES (2:0:4) Use of tools and equipment; projections used in art, advertising, navigation, government maps; relief methods, scribing techniques; map reproduction methods. Prerequisite: SUR 162.

261. FLUID FLOW (3:3:0) Elementary theory of fluid flow: hydrostatics; flow through orifices, Venturi meters, and pipes; flow in open channels; theory of the centrifugal pump. Prerequisites: MATH 087 GQ, MGT T 111.

297. SPECIAL TOPICS (1-9)

COMMUNICATIONS (COMM)

100. (GS) THE MASS MEDIA AND SOCIETY (3:3:0) Mass communications in the United States; organization, role, content, and effects of newspapers, magazines, television, radio, books, and films. May not be used to fulfill requirements of any major in the School of Communications.

150. (GA) THE ART OF THE CINEMA (3:1:3) The development of cinema to its present state; principles of evaluation and appreciation; examples from the past and present.

205. (DF) (WMNST) WOMEN, MINORITIES, AND THE MEDIA (3:3:0) Analysis of historical, economic, legal, political, and social implications of the relationship among women, minorities, and the mass media.

260W. NEWS WRITING AND REPORTING (3:1:4) News and news values; legal and ethical problems of reporting; writing and reporting news for the mass media. Prerequisites: ENGL 015 GWS or 030 GWS; third-semester standing; and typing proficiency.

COMPARATIVE LITERATURE (CMLIT)

001. (GH;DE) MASTERPIECES OF WESTERN LITERATURE THROUGH THE RENAISSANCE (3:3:0) Universal themes and cultural values in works by such writers as Homer, Sappho, Chaucer, Dante, Christine de Pizan, Marguerite de Navarre, and Cervantes.
002. (GH;DE) MASTERPIECES OF WESTERN LITERATURE SINCE THE RENAISSANCE (3:3:0) Universal themes and cultural values in works by such writers as Voltaire, Goethe, Ibsen, Flaubert, Dostoevsky, Dickinson, Mann, Borges, Duras, and Rich.
003. (DH;DF) MASTERPIECES OF LITERATURE FROM AFRICA (3:3:0) From traditional oral forms to contemporary experimental blends of African and Western literary styles. Readings in English.
004. (DH;DF) MASTERPIECES OF LITERATURE FROM THE ORIENT (3:3:0) Major writings from China, Japan, and other East Asian countries, studied in translation and viewed as world literature.
005. (DH;DF) LITERATURES OF THE NEW WORLD (3:3:0) The growth of literature in Brazil, Spanish America, the Caribbean, the United States, and Canada. Readings in English translation.
010. (GH;DF) THE FORMS OF WORLD LITERATURE: A GLOBAL PERSPECTIVE (3:3:0) The development of literature around the world—from epic, legend, lyric, etc., in the oral tradition, to modern written forms.
011. (DH) HEROISM IN WORLD LITERATURE (3:3:0) Cultural values and personal heroism in literary masterworks from a variety of countries and eras.
100. (DH) INTRODUCTION TO COMPARATIVE LITERATURE (3:3:0) Readings from various literatures, organized by themes (utopias, love, the monomyth or heroic quest, etc.) to introduce comparative literary study.
105. (DH;DE) THE DEVELOPMENT OF LITERARY HUMOR (3:3:0) Literary humor expressed as satire, comedy, and farce—from ancient times to the present.
106. (DH;DE) THE ARTHURIAN LEGEND (3:3:0) The legend of King Arthur from medieval Europe to modern Japan; the diverse ideals it has represented in different contexts.
107. (DH;DE) THE LITERATURE OF EXPLORATION: INCREDIBLE VOYAGES FROM ANTIQUITY INTO THE FUTURE (3:3:0) Wanderings amid wonder, from Homer and Lucian and medieval travel legends to Renaissance exploration journals and modern interstellar imaginings.
108. (DH;DF) MYTHS AND MYTHOLOGIES (3:3:0) The myths of non-Western cultures based on selected mythologies from around the world.
111. (DH) LITERATURES OF MODERN INDIA (3:3:0) Sources, achievements, and principal themes of modern Indian poetry and prose; readings in translated or English works of representative authors.
120. THE LITERATURE OF THE OCCULT (3:3:0) Reading and discussion of important literary works dealing with witchcraft, demonology, vampirism, ghosts, from Biblical times to present; films, slides.
141. (DH) RELIGION AND LITERATURE (3:3:0) Major religious themes as expressed in literary masterpieces; sacred texts from various cultures read as literature.
184. (DH) (ENGL) THE SHORT STORY (3:3:0) Lectures, discussions, readings in translation, with emphasis on major writers of the nineteenth and twentieth centuries.
185. (DH) (ENGL) THE MODERN NOVEL IN WORLD LITERATURE (3:3:0) Development of the modern novel in the last century (outside the British Isles and the United States); lectures, discussions, readings in translation.
187. COMPARATIVE LITERATURE FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
189. (DH) (ENGL) THE FOUNDERS OF MODERN DRAMA (3:3:0) Playwrights who set the world's stage for twentieth-century drama: Ibsen, Shaw, Chekhov, and Strindberg.

COMPUTER ENGINEERING TECHNOLOGY (CMPET)

240. MICROPROCESSOR INTERFACING (5:4:2) Examination of the devices used in microprocessor systems to communicate with external digital and analog systems. Prerequisite: EE T 210, EE T 211.
241. ADVANCED MICROPROCESSOR SYSTEMS (4:3:2) Development of an understanding of microprocessor principles and systems through a study of current 8- and 16-bit microprocessors. Prerequisite: EE T 211.
242. MICROPROCESSOR SYSTEMS DESIGN AND ANALYSIS (3:1:4) Experience in designing, constructing, and testing a complete microcomputer system and its practical application to control. Prerequisite: EE T 211.
297. SPECIAL TOPICS (1-9)

COMPUTER SCIENCE (CMPSC)

001. BASIC COMPUTER PROGRAMMING (1:0:2) Fundamental characteristics of digital computers; organization and coding of problems for solution on digital computer. Prerequisite: 2 entrance units in mathematics.

DIETETIC FOOD SYSTEMS MANAGEMENT

100. COMPUTER FUNDAMENTALS AND APPLICATIONS (3:3:0) Introduction to computer fundamentals and applications to data processing environments. Prerequisite: 2 entrance units in mathematics.
101. (GQ) INTRODUCTION TO ALGORITHMIC PROCESSES (3:3:0) Properties of algorithms, languages, and notations for describing algorithms; applications of a procedure-oriented language to problem solving. A student will receive credit for only one of the following courses: CMPSC 101 GQ, 103 GQ, 201 GQ, 203 GQ. Prerequisite: 2 entrance units in mathematics.
102. COMPUTER ORGANIZATION AND PROGRAMMING (3:3:0) Computer components and organization, representation of numbers and characters, instruction codes, machine language, programming, assembly systems, input-output, subroutines, and macros. Prerequisite: CMPSC 101 GQ.
103. (GQ) INTRODUCTION TO PROGRAMMING TECHNIQUES (4:3:2) Design and implementation of algorithms. Structured programming. Problem-solving techniques. Introduction to a high-level, block-structured language, including arrays, procedures, parameters, and recursion. A student may receive credit for only one of the following courses: CMPSC 101 GQ, 103 GQ, 201 GQ, 203 GQ. Prerequisite: 2 entrance units in mathematics.
120. INTERMEDIATE PROGRAMMING (4:3:2) Systematic programming: top-down program development, documentation, and testing. Introduction to data structures, text processing, numerical methods, algorithm analysis, program verification. Prerequisites: CMPSC 103 GQ or 201 GQ; MATH 140 GQ.
140. INTRODUCTION TO DATA PROCESSING (3:3:0) Applications of digital computers to problems in data processing with examples from accounting, record updating, inventory control, and report generation. Prerequisite: CMPSC 101 GQ.
142. PROGRAMMING SYSTEMS FOR SMALL BUSINESS (3:3:0) Business applications programming and systems design applicable to the small business environment. Prerequisite: CMPSC 140 GQ.
144. DATA ORGANIZATION AND ACCESSING TECHNIQUES (4:3:2) Design characteristics of external storage devices; record organizations; accessing considerations for sequential, direct, relative, and indexed files; internal data structures. Prerequisites: CMPSC 102, 140.
154. ADVANCED ASSEMBLER, I/O TECHNIQUES, AND JOB CONTROL LANGUAGES (3:3:1) Macro-expansion; assembler-level I/O control; COBOL-assembler linkage conventions; advanced debugging techniques; assembler design; op-system features and JCL techniques. Students may not take both CMPSC 154 and 442 for credit. Prerequisite: CMPSC 144.
164. CONTEMPORARY TRENDS IN COMPUTER PROGRAMMING (3:3:0) State of the technology in design, code, test, and documentation techniques for information-processing systems and large EDP production programs. Students may not take both CMPSC 164 and 444 for credit. Prerequisite: CMPSC 154.
174. ANALYSIS AND DESIGN OF INFORMATION SYSTEMS (2:1:2) The organization, flow charting, programming, debugging, and documentation of a major applied problem in a field of computer application. Prerequisite: third-semester standing.
175. IMPLEMENTATION OF INFORMATION SYSTEMS (1:0:2) Implementation and evaluation of an information system as designed in CMPSC 174 with peer review of the design. Prerequisite: CMPSC 174.
201. (GQ) COMPUTER PROGRAMMING FOR ENGINEERS (3:3:0) Development and implementation of algorithms in a procedure-oriented language, with emphasis on numerical methods for engineering problems. A student may receive credit for only one of the following: CMPSC 101 GQ, 103 GQ, 201 GQ, 203 GQ. Prerequisite or concurrent: MATH 141 GQ.
203. (GQ) PRINCIPLES OF PROGRAMMING WITH BUSINESS APPLICATIONS (3:2:2) Programming in a high-level language; introduction to computers; packaged software: statistical packages and spreadsheets; designed for business students. A student may receive credit for only one of the following: CMPSC 101 GQ, 103 GQ, 201 GQ, 203 GQ. Prerequisite: 2 entrance units in mathematics.
211. INTRODUCTION TO SYSTEMS PROGRAMMING (3:2:2) Review of computer architecture concepts; assembly language programming, I/O routines, linkage and loading; microprocessor and large computer assembly languages. Prerequisite: CMPSC 120.

CURRICULUM AND INSTRUCTION (C I)

295. INTRODUCTORY FIELD EXPERIENCE FOR TEACHER PREPARATION (2-3 per semester, maximum of 6) Selected observation of schooling situations with small-group and tutorial participation. Prerequisite: second-semester standing. Concurrent: EDTHP 115 and/or EDPSY 014.

DIETETIC FOOD SYSTEMS MANAGEMENT (D S M)

100. THE PROFESSION OF DIETETICS (1:1:0) Introduction to the profession and exploration of the roles and responsibilities of dietetic professionals.
101. SANITATION PRACTICES IN FOOD SERVICE OPERATIONS (3:3:0) Practical applications related to the management of the sanitation subsystem within a food service operation. This course will not meet the prescribed requirements for the HR&IM major in any option.

EARTH SCIENCES

103. **FOOD SERVICE MANAGEMENT: THEORY AND PRACTICE** (3:3:0) Professional functions of the food service system, relationships with the nutrition component of food service systems.
105. **INTRODUCTION TO SCHOOL FOOD SERVICE** (2:2:0) History of school food service programs and exploration of management opportunities, methods, and concepts of various food service systems.
195. **FIELD EXPERIENCE IN COMMUNITY DIETETICS** (2:1:2) Planning, preparation, and field experiences in community dietetic programs. Prerequisites: D S M 103, NUTR 151.
205. **HUMAN RESOURCE MANAGEMENT IN FOOD SERVICE OPERATIONS** (3:3:0) Theories and principles of supervision and training of food service employees for overall operational effectiveness.
250. **QUANTITY FOOD PRODUCTION MANAGEMENT** (4:3:1) Systems approach to managing quantity food production functions in health care settings; included are quantity food production principles and standards.
260. **MANAGEMENT OF FOOD SERVICE OPERATING SYSTEMS** (4:3:1) Major principles related to managing the purchasing, food, and labor subsystems of a health care food service system. Prerequisite: D S M 250.
265. **COMPUTER APPLICATION IN FOOD SERVICE INFORMATION SYSTEMS** (2-3) Introduction to food service information system concepts, including phases of planning, implementation, and controlling the system.
270. **QUALITY ASSURANCE FOR DIETETIC MANAGEMENT** (3:2:2) Theories, principles, and methods of managing quality dietetic services. Prerequisites: D S M 103, NUTR 252.
- 295W. **PROFESSIONAL STAFF FIELD EXPERIENCE** (4:1:6) Methods of, and practice in, the client-oriented dietetic systems. Prerequisites: D S M 195, 205, 260; NUTR 151 or 251 GHS.
304. **MARKETING OF FOOD SERVICES IN HEALTH CARE FACILITIES** (3:3:0) Theories and applications of marketing principles to the design of consumer-oriented dietetic services.

EARTH SCIENCES (EARTH)

001. **EARTH SCIENCE** (3:3:0) Integrated approach to fundamental problems in the earth sciences. Fields of study include geological sciences, physical geography, and meteorology. No credit will be given for this course if a student takes GEOG 019, GEOSC 020 GN or METEO 002 GN.
002. (GN) **GAIA—THE EARTH SYSTEM** (3:3:0) An interdisciplinary introduction to the processes, interactions, and evolution of the Earth's biosphere, geosphere, and hydrosphere.

ECONOMICS (ECON)

002. (GS) **INTRODUCTORY MICROECONOMIC ANALYSIS AND POLICY** (3:3:0) Methods of economic analysis and their use; economic aggregates; price determination; theory of the firm; distribution.
004. (GS) **INTRODUCTORY MACROECONOMIC ANALYSIS AND POLICY** (3:3:0) National income measurement; aggregate economic models; money and income; policy problems.
014. (GS) **PRINCIPLES OF ECONOMICS** (3:3:0) Analysis of the American economy, emphasizing the nature and interrelationships of such groups as consumers, business, governments, labor, and financial institutions. Students who have passed ECON 002 GS or 004 GS or are registered in The Smeal College of Business Administration may not schedule this course.
187. **ECONOMICS FRESHMAN SEMINAR** (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
302. (DS) **INTERMEDIATE MICROECONOMIC ANALYSIS** (3:3:0) Allocation of resources and distribution of income within various market structures, with emphasis on analytical tools. Prerequisite: ECON 002 GS.
304. (DS) **INTERMEDIATE MACROECONOMIC ANALYSIS** (3:3:0) Analysis of forces that determine the level of aggregate economic activity. Prerequisite: ECON 004 GS.
315. (DS) **LABOR ECONOMICS** (3:3:0) Economic analysis of employment, earnings, and the labor market; labor relations; related government policies. Prerequisite: ECON 002 GS.
323. (DS) **PUBLIC FINANCE** (3:3:0) Contemporary fiscal institutions in the United States; public expenditures; public revenues; incidence of major tax types; intergovernmental fiscal relations; public credit. Prerequisite: ECON 002 GS.
333. (DS) **INTERNATIONAL ECONOMICS** (3:3:0) Why nations trade, barriers to trade, balance of payments, adjustment and exchange rate determination, Eurocurrency markets, and trade-related institutions. Prerequisite: ECON 002 GS, 004 GS, or 014 GS.
342. (DS) **INDUSTRIAL ORGANIZATION** (3:3:0) Industrial concentration, size and efficiency of business firms, market structure and performance, competitive behavior, public policy and antitrust issues. Prerequisite: ECON 002 GS.
370. (DS) **COMPARATIVE ECONOMIC SYSTEMS** (3:3:0) Capitalism, socialism, communism, and fascism; examination of resource allocation, consumption, pricing, production, investment, income distribution, central planning. Prerequisites: ECON 002 GS or 014 GS; 3 additional credits in social science.

372. (DS) SOVIET AND OTHER CENTRALLY PLANNED ECONOMIES (3:3:0) Comparative analysis of resource allocation principles, planning methodologies, investment, industry, agriculture, domestic and foreign trade in centrally planned economies. Prerequisites: ECON 002 GS or 014 GS; 3 credits in related social science.

EDUCATIONAL PSYCHOLOGY (EDPSY)

014. LEARNING AND INSTRUCTION (3:3:0) Psychology of human learning applied toward the achievement of educational goals; evaluation of learning outcomes.

101. (GQ) ANALYSIS AND INTERPRETATION OF STATISTICAL DATA IN EDUCATION (3:3:0) An introduction to quantitative methods in educational research emphasizing the interpretation of frequently encountered statistical procedures.

297. SPECIAL TOPICS (1-9)

EDUCATIONAL THEORY AND POLICY (EDTHP)

115. EDUCATION IN AMERICAN SOCIETY (3:3:0) Introduction to the development of educational institutions, with emphasis on historical, philosophical, and sociological forces.

ELECTRICAL ENGINEERING TECHNOLOGY (EE T)

100. APPLIED ELECTRICITY (3:2:2) AC and DC circuits; machinery; controls; and introduction to electronic devices, circuits, and instrumentation. Prerequisites: MATH 087 GQ, PHYS 151.

101. FUNDAMENTALS OF ELECTRICAL CIRCUITS (3:3:0) Fundamental theory of resistance, current, voltage. Direct-current concepts from simple series circuits through Thevenin's Theorem. Prerequisite or concurrent: MATH 087 GQ.

109. ELECTRICAL CIRCUITS LABORATORY (1:0:2) Introduction to electrical apparatus, including instruments, their interconnection into basic circuits, observation of circuit behavior, and report writing. Concurrent: EE T 101.

114. ELECTRICAL CIRCUITS (3:3:0) Direct-current circuit analysis; introduction to basic magnetism and magnetic circuits; single-phase circuit fundamentals. Prerequisites: EE T 101, MATH 087 GQ.

117. DIGITAL ELECTRONICS (3:3:0) Fundamentals of digital circuits, including logic circuits, boolean algebra, Karnaugh maps, counters, and registers. Prerequisite: EE T 101.

118. ELECTRICAL CIRCUITS LABORATORY (1:0:2) Laboratory study of direct-current networks and alternating-current circuits. Prerequisite: EE T 109. Concurrent: EE T 114.

120. DIGITAL ELECTRONICS LABORATORY (1:0:2) Laboratory study of solid state pulse, digital, industrial, and motor control circuits. Prerequisite: EE T 205. Concurrent: EE T 117.

204. AC CIRCUITS (2:2:0) Application of network theorems, laws; and methods to alternating-current circuits; balanced and unbalanced polyphase systems. Prerequisite: EE T 114.

205. SEMICONDUCTOR LABORATORY (1:0:2) Laboratory study of semiconductors. Assembly and tracing of electronic circuits. Concurrent: EE T 210.

206. AC CIRCUITRY LABORATORY (1:0:2) Laboratory study of alternating-current circuits; assembly and tracing of electrical circuits. Concurrent: EE T 204.

210. FUNDAMENTALS OF SEMICONDUCTORS (3:3:0) Semiconductor physics and circuit theory including hybrid parameters; equivalent circuits; power amplifiers and frequency response of small signal amplifiers. Prerequisite or concurrent: EE T 114, MATH 088 GQ.

211. MICROPROCESSORS (4:3:2) A study of machine language programming, architecture, and interfacing for microprocessor-based systems emphasizing engineering applications and microcomputers. Prerequisite: EE T 117.

213. FUNDAMENTALS OF ELECTRICAL MACHINES (3:2:2) Direct-current machinery principles and applications; introduction to machines and basic concepts of laboratory methods related to machinery studies. Prerequisites: EE T 114, 118.

213W. FUNDAMENTALS OF ELECTRICAL MACHINES USING WRITING SKILLS (3:2:2) Electric machinery principles and applications; basic concepts of laboratory methods related to machinery studies; writing of formal reports. Prerequisites: EE T 114, 118.

215. AC MACHINERY AND CONTROL (3:3:0) Alternating-current machinery principles and applications; survey of alternating- and direct-current machinery control methods. Prerequisites: EE T 204, 213.

216. LINEAR ELECTRONIC CIRCUITS (3:3:0) Theoretical study of linear electronic devices and circuits, including field effect transistors, integrated circuits, and operational amplifiers. Prerequisite: EE T 210.

219. AC MACHINERY LABORATORY (1:0:2) Alternators, induction generators, single- and polyphase motors, synchro units, transformers, saturable reactors, and protective devices. Prerequisite: EE T 206. Concurrent: EE T 215.

ENGINEERING

221. LINEAR ELECTRONICS LABORATORY (1:0:2) Laboratory study of transistors; study of differential and operational amplifiers. Emphasis is placed on circuit design. Prerequisite: EE T 205. Concurrent: EE T 216.
297. SPECIAL TOPICS (1-9)

ENGINEERING (ENGR)

002. ENGINEERING ORIENTATION (1:0:2) Introduction to efficient methods for analyzing and solving engineering problems.
005. EXPERIMENTAL METHODS FOR ENGINEERS (1:0:2) Introduction to experimental methods used in engineering. Applications of basic experimental and computational concepts through student involvement in laboratory experiments.

ENGINEERING GRAPHICS (E G)

003. ARCHITECTURAL GRAPHICS (2:0:6) Principles of architectural drawing; spatial relationships of points, lines, planes, and solids, with architectural applications; shadows, perspective.
010. INTRODUCTORY ENGINEERING GRAPHICS (1:0:3) Multiview projections, pictorial drawings, dimensioning, engineering standards, and working drawings.
011. ENGINEERING DESIGN GRAPHICS (1:0:3) Introduction to creative design, space analysis, graphs, graphical mathematics, vector analysis, and design implementation. Prerequisite: E G 010 or 021.
050. ENGINEERING METHODS AND GRAPHICAL COMMUNICATION (3:1:5) Introduction to engineering through graphics (multiviews, pictorials, dimensioning, space analysis); microcomputer literacy in BASIC, with computer graphics and instrumentation laboratory.

ENGINEERING GRAPHICS TECHNOLOGY (EG T)

101. TECHNICAL DRAWING FUNDAMENTALS (1:0:2) Technical skills and drafting room practices; fundamentals of theoretical graphics; orthographic projection including sectional and auxiliary views; dimensioning.
102. INTRODUCTION TO COMPUTER-AIDED DRAFTING (1:0:2) A first course presenting an intensive study utilizing a computer-assisted drafting and design system to obtain graphic solutions.
103. SPATIAL ANALYSIS (2:1:2) Spatial relations of points, lines, and solids with applications in engineering technology. Prerequisite: EG T 101.
104. COMPUTER-AIDED DRAFTING (1:0:2) A second course on the more advanced functionality of computer-aided drafting and design systems. Prerequisite: EG T 102.
201. ADVANCED COMPUTER-AIDED DRAFTING (2:1:2) Application of principles of engineering graphics; preparation of working drawings; details, examples, and bill of material using CAD. Prerequisite: EG T 101, 102, or 104.
297. SPECIAL TOPICS (1-9)

ENGLISH (ENGL)

001. (GH;DE) UNDERSTANDING LITERATURE (3:3:0) Explores how major fiction, drama, and poetry, past and present, primarily English and American, clarify enduring human values and issues.
002. (GH) THE GREAT TRADITIONS IN ENGLISH LITERATURE (3:3:0) Major works of fiction, drama, and poetry from the Middle Ages to the twentieth century expressing enduring issues and values.
003. (GH;DE) THE GREAT TRADITIONS IN AMERICAN LITERATURE (3:3:0) Major works of fiction, drama, and poetry from the colonial to the modern periods expressing enduring issues and values.
004. BASIC WRITING SKILLS (3:3:0 per semester, maximum of 6) Intensive practice in writing sentences and paragraphs, and instruction in grammar, usage, and punctuation. Designed for students with deficient preparation. *This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program.*
005. WRITING TUTORIAL (1:0:2) Tutorial instruction in composition and rhetoric for students currently enrolled in ENGL 004 or 015 (GWS;DEX). *This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program.*
015. (GWS;DEX) RHETORIC AND COMPOSITION (3:3:0) Instruction and practice in writing expository prose that shows sensitivity to audience and purpose. Prerequisite: ENGL 004 or satisfactory performance on the English proficiency examination.
030. (GWS;DEX) HONORS FRESHMAN COMPOSITION (3:3:0) Writing practice for especially qualified and screened students. Students who have passed a special writing test will qualify for this course.

050. (DA) INTRODUCTION TO CREATIVE WRITING (3:3:0) Practice and criticism in the reading, analysis, and composition of fiction, nonfiction, and poetry writing.
104. (DH) THE BIBLE AS LITERATURE (3:3:0) Study of the English Bible as a literary and cultural document.
129. (DH) SHAKESPEARE (3:3:0) A selection of the major plays studied to determine the sources of their permanent appeal. Intended for nonmajors.
133. (DH) MODERN AMERICAN LITERATURE TO WORLD WAR II (3:3:0) Cather, Eliot, Frost, Faulkner, Fitzgerald, Hemingway, Hurston, Wharton, Wright, and other writers representative of the years between the world wars.
134. (DH) AMERICAN COMEDY (3:3:0) Studies in American comedy and satire, including such writers as Mark Twain, Faulkner, Vonnegut, Ellison, O'Connor, Welty, and Heller.
139. (DH;DF) BLACK AMERICAN LITERATURE (3:3:0) Fiction, poetry, and drama, including such writers as Baldwin, Douglass, Ellison, Morrison, and Wright.
140. (DH) CONTEMPORARY LITERATURE (3:3:0) Writers such as Baldwin, Beckett, Bellow, Ellison, Gordimer, Lessing, Lowell, Mailer, Naipaul, Pinter, Plath, Pynchon, Rushdie, and Walker.
184. (DH) (CMLIT) THE SHORT STORY (3:3:0) Lectures, discussions, readings in translation, with primary emphasis on major writers of the nineteenth and twentieth centuries.
185. (DH) (CMLIT) THE MODERN NOVEL IN WORLD LITERATURE (3:3:0) Development of the modern novel in the last century (outside the British Isles and the United States); lectures, discussions, readings in translation.
187. ENGLISH FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
189. (DH) (CMLIT) THE FOUNDERS OF MODERN DRAMA (3:3:0) Playwrights who set the world's stage for twentieth-century drama: Ibsen, Shaw, Chekhov, and Strindberg.
191. (DH;DEX) SCIENCE FICTION (3:3:0) Science fiction as the literature of technological innovation and social change—its development, themes, and problems.
192. (DEX) THE LITERATURE OF FANTASY (3:3:0) Major realms of fantasy in English and American literature: daydream and nightmare, the pastoral, dystopia, utopia, apocalypse, and the heroic.
193. (AM ST) AMERICAN FOLK SONG IN ENGLISH (3:3:0) British songs in America; native repertoires, White and Black; folk ballad; and musical development.
194. (DH;DF) (WMNST) WOMEN WRITERS (3:3:0) Short stories, novels, poetry, drama, and essays by English, American, and other English-speaking women writers.
196. (AM ST) INTRODUCTION TO AMERICAN FOLKLORE (3:3:0) A basic introduction to verbal and non-verbal folklore, stressing the basic procedures of collection, classification, and analysis.
- 202A. (GWS) EFFECTIVE WRITING: WRITING IN THE SOCIAL SCIENCES (3:3:0) Instruction in writing persuasive arguments about significant issues in the social sciences. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 GWS;DEX or 030 GWS;DEX; fourth-semester standing.
- 202B. (GWS) EFFECTIVE WRITING: WRITING IN THE HUMANITIES (3:3:0) Instruction in writing persuasive arguments about significant issues in the humanities. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 GWS;DEX or 030 GWS;DEX; fourth-semester standing.
- 202C. (GWS) EFFECTIVE WRITING: TECHNICAL WRITING (3:3:0) Writing for students in scientific and technical disciplines. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 GWS;DEX or 030 GWS;DEX; fourth-semester standing.
- 202D. (GWS) EFFECTIVE WRITING: BUSINESS WRITING (3:3:0) Writing reports and other common forms of business communication. (A student may take only one course for credit from ENGL 202A, 202B, 202C, and 202D. A student who has passed ENGL 201, 211, 218, or 219 may not schedule this course.) Prerequisites: ENGL 015 GWS;DEX or 030 GWS;DEX; fourth-semester standing.
297. SPECIAL TOPICS (1-9)

ENTOMOLOGY (ENT)

012. BIOLOGY AND MANAGEMENT OF PLANT PESTS (3:2:2) Basic and practical information on the identification, habits, and control of important insect pests of plants and plant products.

EXERCISE AND SPORT ACTIVITIES (ESACT)

Exercise and sport activities courses with the suffix GPE satisfy the physical education portion of the Health Sciences and Physical Education General Education program requirements. For a current list of ESACT courses, see the Penn State *Baccalaureate Degree Programs Bulletin*.

FINANCE (FIN)

100. INTRODUCTION TO FINANCE (3:3:0) The nature, scope, and interdependence of the institutional and individual participants in the financial system. A student may not receive credit toward graduation for both FIN 100 and FIN 301. Prerequisite: third-semester standing.

108. PERSONAL FINANCE (3:3:0) Personal management of budgets, bank accounts, loans, credit buying, insurance, real estate, and security buying. May not be scheduled by Smeal College of Business Administration students. Prerequisite: third-semester standing.

297. SPECIAL TOPICS (1-9)

301. CORPORATION FINANCE (3:3:0) The acquisition and management of corporate capital; analysis of operations, forecasting capital requirements, raising capital, and planning profits. Prerequisites: ACCTG 200; ECON 002 GS, 004 GS; MATH 110 GQ; MSIS 201.

FOOD SCIENCE (FD SC)

105. (GHS) (S T S) FOOD FACTS AND FADS (3:3:0) Impact on society and the individual of modern food technology, food laws, additives, etc; historical, current, and futuristic aspects.

FORESTRY (FOR)

105. FOREST MENSURATION (3:2:3) Measurement of forests and forest products.

106. FOREST INVENTORIES (3:2:4) Application of land surveying and sampling techniques, including statistical analysis, for the determination of timber volume and growth.

108. FIELD STUDIES IN ECOLOGY (1) Field studies in ecological problems, challenges, and impacts related to normal forest practices in general resource management.

137. INTRODUCTION TO HARVESTING (1:0:4) Field application of harvesting techniques, including sale layout and operation of hand and power equipment.

138. INTERMEDIATE OPERATIONS (1:0:4) Field practicum in planting, pruning, and thinning of forest stands. Prerequisite: FOR 137.

140. LETTERING AND DRAFTING (2:0:4) Freehand, mechanical, transfer lettering skills and drafting room practices.

141. FOREST SURVEYING (4:2:8) Plane surveying and mapping techniques as applied to forestry practices. Prerequisite or concurrent: FOR 140, MATH 087 GQ.

220. FOREST ECOSYSTEM PROTECTION (3:3:0) Principles and concepts involved in managing the forest ecosystem in regard to fires, insects, and diseases.

221. FOREST FIRE TECHNOLOGY (1:0:3) Technological aspects of controlling and using fire in the forest environment. Prerequisite: FOR 220.

234. RECLAMATION MANAGEMENT (3:2:3) Consideration of various factors of soils, hydrology, and reclamation in the reclaiming and revegetation of disturbed sites. Prerequisite: FOR 141, 366, CE 114, or 210.

240. SILVICULTURAL PRACTICES (3:2:3) Principles and techniques of forest establishment, culture, regeneration, and harvesting. Prerequisite: FOR 203 or 250.

241. AERIAL PHOTO INTERPRETATION (4:2:6) Aerial photo interpretation techniques applied to land management inventories, mapping, road location, and procurement. Prerequisites: FOR 203; FOR 105 and 106, or FOR 366.

242. ELEMENTS OF PROJECT SUPERVISION IN FORESTRY (3:3:0) Supervisory techniques developed through an understanding of the behavioral sciences applied to field forestry personnel management.

245. MICROCOMPUTERS IN FORESTRY (2:1:2) Computer literacy; elementary programming in basic and software applications in forestry. Prerequisite: 3 credits in mathematics.

250. DENDROLOGY (3:0:6) Taxonomy, identification, ranges, and uses of important U.S. timber species and lesser vegetation of a regional nature.

814. FORESTRY LEADERSHIP PRACTICUM (1:0:3) Leadership techniques applied to standard forestry field operations. Prerequisite: FOR 242.

817. URBAN FORESTRY (3:2:3) The application of land treatment techniques and forestry practices to urban environments.
822. FOREST MANAGEMENT SYSTEMS (2) Field projects and an extended field tour dealing with silvicultural, mensurational, and regulation techniques of forest management planning. Prerequisite: FOR 240.
860. FOREST VALUATION (1) Gathering and analyzing cost and production data related to stumpage valuation and equipment management. Prerequisite: FOR 106.

FRENCH (FR)

001. ELEMENTARY FRENCH I (4:4:0) Grammar, with reading and writing of simple French; oral and aural work stressed. Students who have received high school credit for two or more years of French may not schedule this course for credit without permission of the department.
002. ELEMENTARY FRENCH II (4:4:0) Grammar and reading continued; oral and aural phases progressively increased. Students who have received high school credit for four years of French may not schedule this course for credit without permission of the department. Prerequisite: FR 001.
003. INTERMEDIATE FRENCH (4:4:0) Grammar, reading, composition, oral and aural exercises. Prerequisite: FR 002.
139. (GH;DF) FRANCE AND THE FRENCH-SPEAKING WORLD (3:3:0) An introduction to the culture of France and its impact on the world.
140. FRENCH NOVEL IN ENGLISH TRANSLATION (1-6) Readings of selected French masterpieces in translation; discussion of recurring themes in several literary periods.
142. (GH;DE) FRENCH LITERATURE IN TRANSLATION (3:3:0) An introduction to the literature of France and French-speaking countries.
187. FRENCH FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

GEOGRAPHY (GEOG)

010. (GN) PHYSICAL GEOGRAPHY: AN INTRODUCTION (3:2:2) Survey and synthesis of processes creating geographical patterns of natural resources, with application of basic environmental processes in resource management.
020. (GS;DE) HUMAN GEOGRAPHY: AN INTRODUCTION (3:3:0) Spatial perspective on human societies in a modernizing world; regional examples; use of space and environmental resources; elements of geographic planning.
100. (DS) ECONOMIC GEOGRAPHY (3:3:0) The location of economic activity at both macro- and micro-regional levels on the Earth's surface.
102. (DH) THE AMERICAN SCENE (3:3:0) How Americans converted wilderness into domesticated landscapes, and how the American scene visibly reflects national and regional cultures.
103. (DS;DF) GEOGRAPHY OF DEVELOPING WORLD (3:3:0) Patterns of poverty in poor countries; conventional and nonconventional explanations; focus on solutions; case studies of specific regions.
110. (DN) CLIMATES OF THE WORLD (3:2:2) Introduction to climatology, including principal processes of the global climatic system and their variation over space and time.
115. (DN) LANDFORMS OF THE WORLD (3:2:2) Distribution of the world's landform features and mineral resources; their characteristics, causes, and significance. Practicum includes correlated field trips and laboratory studies.
120. (DS) URBAN GEOGRAPHY (3:3:0) Urban growth and stagnation; location of cities and urban systems; intraurban spatial structure; contemporary American urban problems.
124. (DS) ELEMENTS OF CULTURAL GEOGRAPHY (3:3:0) Locational analysis of changes in non-Western cultures. Problems of plural societies, economic development, population growth, and settlement.
128. (DS) GEOGRAPHY OF INTERNATIONAL AFFAIRS (3:3:0) Contemporary international affairs in their geographical setting; geographic elements in the development of national power, political groupings, and international disputes.

GEOSCIENCES (GEOSC)

- * 001. PHYSICAL GEOLOGY (3:2:3) Earth processes and their effects on the materials, structure, and morphology of the Earth's crust. Practicum includes field work, study of rocks, minerals, dynamic models, and topographic maps.
- * 020. (GN) PLANET EARTH (3:2:2) Nontechnical presentation of Earth processes, materials, and landscape. Practicum includes field trips, study of maps, rocks, and dynamic models, introduction to geologic experimentation.
- * 021. (GN) EARTH HISTORY (3:2:2) Evolution of the Earth; changing patterns of mountains, lowlands, and seas; development of living organisms. Practicum includes field trips, studies of geologic maps, geologic problems, fossils.
- 040. (GN) THE SEA AROUND US (3:2:2) Introduction to marine science, including physical, chemical, biological, and geological aspects of oceanography; the sea as a multipurpose natural resource.

GERMAN (GER)

- 001. ELEMENTARY GERMAN I (4:3:2) Listening, speaking, reading, writing; introduction to basic structures and vocabulary through dialogues and literary and cultural readings. Students may receive credit for only one of the following: GER 001, 011, or 015. Students who have received high school credit for two or more years of German may not schedule this course for credit without permission of the department.
- 002. ELEMENTARY GERMAN II (4:3:2) Listening, speaking, reading, writing; introduction to basic structures and vocabulary through dialogues and literary and cultural readings. Students may receive credit for only one of the following: GER 002, 012, or 016. Students who have received high school credit for four years of German may not schedule this course for credit without permission of the department. Prerequisite: GER 001.
- 003. INTERMEDIATE GERMAN (4:3:2) Continued skill development; readings consisting of short literary and journalistic writings; increased attention to German cultural context. Students may receive credit for only one of the following: GER 003, 012, or 016. Prerequisite: GER 002.
- 011. INTENSIVE BASIC GERMAN (6:5:2) Listening, speaking, reading, writing basic structures and vocabulary of German. Taught on an accelerated basis. Students may receive credit for only one of the following: GER 001, 011, or 015.
- 012. INTENSIVE INTERMEDIATE GERMAN (6:5:2) Continued skill development of structures and vocabulary; listening, speaking, reading, writing. Taught on an accelerated basis. Students may receive credit for only one of the following: GER 002, 003, 012, or 016. Prerequisite: GER 011.
- 015. READING GERMAN I (3:3:0) Survey of German grammar, with readings in technical prose, for students whose programs permit only two semesters of foreign language. Students may receive credit for only one of the following: GER 001, 011, or 015.
- 016. READING GERMAN II (3:3:0) Continuation of GER 015, with readings in the student's own field. Students may receive credit for only one of the following: GER 002, 012, or 016. Prerequisite: GER 015.
- 100. (GH;DF) GERMAN CULTURE AND CIVILIZATION (3:3:0) Life of the German people from the early Middle Ages to modern times; their literature and arts, music, science, and philosophy. Conducted in English.
- 120. (DH) THE FAUST THEME IN LITERATURE AND IN OTHER ARTS (3:3:0) Survey of the Faust theme in literature (Spieß, Marlowe, Goethe, Mann), book illustrations, music (Gounod), theatre, film, and visual arts.
- 150. (GH) MASTERPIECES OF GERMAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Major works and prominent authors, e.g., *Niebelungenlied*, *Tristan*, Lessing, Goethe, Schiller, Heine, Hauptmann, Hesse, Mann, Kafka, Böll, Grass, Frisch.
- 157. (DH;DF) PENNSYLVANIA GERMANS: THE CULTURE OF THE SECTARIANS (3:3:0) Survey of the background, customs, literature, religion, folklore, folk art, music, and education of the Pennsylvania Germans. Conducted in English.
- 180. (DH) GOETHE AND HIS CONTEMPORARIES IN ENGLISH TRANSLATION (3:3:0) Major works of Goethe and his contemporaries, especially Schiller, in translation.
- 187. GERMAN FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
- 190. (DH) TWENTIETH-CENTURY GERMAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Works of such writers as Brecht, Dürrenmatt, Grass, Hesse, Kafka, Mann, Rilke, and Weiss.
- 195. (DH) MODERN GERMAN DRAMA AND THEATRE (3:3:0) Plays and their stage realization by writers such as Hauptmann, Schnitzler, Wedekind, Kaiser, Brecht, Dürrenmatt, Weiss, Handke, and Fassbinder.

*This course includes from one to several field trips for which an additional charge will be made to cover transportation.

200. (DH;DF) CONTEMPORARY GERMAN CULTURE (3:3:0) Survey of divided and unified Germany after World War II, her politics, economics, society, arts, and educational system in the international context. Conducted in English.

GREEK (GREEK)

001. ELEMENTARY CLASSICAL AND NEW TESTAMENT GREEK (4:3:2) Pronunciation, forms, syntax, and translation.

002. ELEMENTARY CLASSICAL AND NEW TESTAMENT GREEK (4:3:2) Further instruction in syntax and sentence structure. Prerequisite: GREEK 001.

003. INTERMEDIATE CLASSICAL AND NEW TESTAMENT GREEK (4:3:2) Selections from representative authors. Prerequisite: GREEK 002.

187. GREEK FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

297. SPECIAL TOPICS (1–9)

HEALTH EDUCATION (HL ED)

003. (GHS) DRUGS IN SPORTS (1:1:0) Nature of drug use, misuse, and abuse in the athletic setting with implications for counseling and controls.

005. (GHS) HEALTH ASPECTS OF SPORT (1:1:0) Basic principles and concepts of safety, health, and fitness for recreation and sport.

013. (GHS) STANDARD FIRST AID, PERSONAL SAFETY, AND CPR (1:1:1) Theoretical and technical aspects of standard first aid, personal safety, and cardiopulmonary resuscitation (CPR).

015. (GHS) LIFE-STYLE FOR BETTER HEALTH (1:1:0) Concepts of health, life-style, and risk factors; development and implementation of personal action plans.

019. (GHS) HEALTH AND DISEASE (1:1:0) Essentials of communicable and chronic disease control.

043. (GHS) DRUGS IN SOCIETY (1:1:0) An exploration of the health-related aspects of drug use and abuse.

044. (GHS) INTRODUCTION TO DEATH EDUCATION (1:1:0) Educational and consumer aspects of dying and death from a health education perspective.

045. (GHS) ALCOHOL AWARENESS EDUCATION (1:1:0) A course designed to raise awareness relative to the use and abuse of beverage alcohol.

046. (GHS) INTRODUCTION TO HEALTH ASPECTS OF HUMAN SEXUALITY (1:1:0) An examination of health concerns related to sexuality and sexual behavior.

048. (GHS) VALUES AND HEALTH BEHAVIOR (1:1:0) An exploration of opinions, beliefs, attitudes, and personal values as they relate to decision making and health behavior.

057. (GHS) CONSUMER HEALTH (1:1:0) Essentials for determining credibility of claims for particular health services and products from a consumer's perspective.

060. (GHS) PRINCIPLES AND PRACTICES OF HEALTHFUL LIVING (3:3:0) Facts and principles as related and applied to the science of living serve as a basis for health instruction and student guidance.

100. PHYSICAL THERAPIST ASSISTANT—INTRODUCTION (3:2:2) Orientation to the field of physical therapy, historical background of the profession, professional ethics, medical terminology, and patient transportation techniques.

150. PHYSICAL THERAPIST ASSISTANT—PROCEDURES I (2:1:2) General considerations for basic physical therapy modalities, including their indications, contraindications, skill development, and practical application.

160. THERAPEUTIC EXERCISE I (2:1:2) Introduction to the principles of exercise in the treatment of disease and injury.

250. PHYSICAL THERAPIST ASSISTANT—PROCEDURES II (3:1:4) General considerations for physical therapy modalities, including their indications, contraindications, skill development, and practical application.

260. THERAPEUTIC EXERCISE II (2:1:2) Advanced principles of exercise in the treatment of disease and injury.

270. PATHOPHYSIOLOGY (3:3:0) Introduction to medical and postoperative conditions and/or disease states most frequently treated by physical therapy modalities.

280. REHABILITATION (3:2:2) Examination of techniques and laboratory experiences in rehabilitation techniques for the physically challenged.

303. (GHS) EMERGENCY CARE (3:2:2) Competencies leading toward certification in Advanced First Aid and Emergency Care and Cardiopulmonary Resuscitation.

HEALTH POLICY AND ADMINISTRATION

384. APPLIED KINESIOLOGY (3:2:2) Study of anatomical structure, body movement. Characteristic muscle action and motion will be analyzed in relation to physical therapy context. Prerequisite: BIOL 029.

395E, 395F, 395G. PHYSICAL THERAPIST ASSISTANT—PRACTICUM I, II, III (4 credits each) The practice of physical therapist assistant skills in a clinical setting under the direct supervision of a physical therapist. Prerequisites: HL ED 150, 160, 250, 260, 280.

HEALTH POLICY AND ADMINISTRATION (H P A)

101. INTRODUCTION TO HEALTH SERVICES ORGANIZATION (3:3:0) Examination of social, political, economic, historic, and scientific factors in the development and organization of the medical care health services.

301. HEALTH SERVICES POLICY ISSUES (3:3:0) Analysis of major issues in health services delivery in hospitals, medical practice, public health, mental health, and health professional education. Prerequisites: H P A 101, PL SC 001 GS, ECON 002 GS.

310. HEALTH CARE AND MEDICAL NEEDS (3:3:0) Health care from an individual, family, and community standpoint illustrated with specific diseases and health problems. Prerequisite: 3 credits in biology.

HEBREW (HEBR)

001. BASIC MODERN HEBREW (4:3:2) An introduction to modern Hebrew in its written and spoken forms; oral and aural work stressed.

002. BASIC MODERN HEBREW II (4:3:2) Continued study of grammar; emphasis on improving oral-aural facility, with increased attention to reading and writing. Prerequisite: HEBR 001.

003. INTERMEDIATE MODERN HEBREW (4:3:2) Grammar, reading, composition, and oral and aural exercises. Prerequisite: HEBR 002.

010. (GH;DF) JEWISH CIVILIZATION (3:3:0) Life of the Jewish people from Biblical times, emphasizing cultural, religious, and institutional developments.

187. HEBREW FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester and enrollment in the College of the Liberal Arts.

295. INTERNSHIP (1-8)

296. INDEPENDENT STUDIES (1-18)

297. SPECIAL TOPICS (1-9)

HISTORY (HIST)

001. (GH) THE WESTERN HERITAGE I (3:3:0) A survey of the Western heritage from the ancient Mediterranean world to the dawn of modern Europe.

002. (GH) THE WESTERN HERITAGE II (3:3:0) A survey of the Western heritage from the dawn of modern Europe in the seventeenth century to the present.

003. (GH) THE AMERICAN NATION: HISTORICAL PERSPECTIVES (3:3:0) Central themes in American history from discovery and settlement to the present.

010. (GH;DF) NON-WESTERN CIVILIZATIONS (3:3:0) Introduction to social, economic, and political evolution of non-Western cultures; responses to the West; modernization and development.

012. (DH) HISTORY OF PENNSYLVANIA (3:3:0) Chronological and topical survey, emphasizing immigration of diverse ethnic groups and religious, political, economic, and social developments, including industrialization and urbanization.

020. (DH;DE) AMERICAN CIVILIZATION TO 1877 (3:3:0) A historical survey of the American experience from its colonial beginnings through the Civil War and Reconstruction.

021. (DH;DE) AMERICAN CIVILIZATION SINCE 1877 (3:3:0) A historical survey of the American experience from the emergence of urban-industrial society in the late nineteenth century to the present.

100. (DH) ANCIENT GREECE (3:3:0) Greek world from the earliest Aegean cultures to the death of Alexander the Great and the beginnings of Hellenistic civilization.

101. (DH) THE ROMAN REPUBLIC AND EMPIRE (3:3:0) History of the Roman Republic and Empire from the origins of Rome to the disintegration of the Empire.

105. (DH) THE BYZANTINE EMPIRE (3:3:0) Development of Byzantine civilization from the decline of the Roman Empire to the fall of Constantinople.

107. (DH) (MEDVL) MEDIEVAL EUROPE (3:3:0) Rise and development of the civilization of medieval Europe from the decline of Rome to 1500.

108. (DH) THE CRUSADES: HOLY WAR IN THE MIDDLE AGES (3:3:0) The social and political history of medieval religious warfare in Europe and the Middle East.

HOTEL, RESTAURANT, AND INSTITUTIONAL MANAGEMENT

116. (DS) (WMNST) FAMILY AND SEX ROLES IN MODERN HISTORY (3:3:0) Historical perspectives on the Western family since 1500: gender roles, marriage, sexuality, child rearing, and old age; emphasis on United States.
117. (DH) (WMNST) WOMEN IN MODERN HISTORY (3:3:0) Modernization and women: changing images and roles since the mid-eighteenth century in the family, workshop, politics, society; cross-cultural comparisons.
120. (DS) EUROPE SINCE 1848 (3:3:0) Political, social, and ideological developments; origin and impact of two World Wars; totalitarianism and democracy; changing role in the world.
141. (DH) MEDIEVAL AND MODERN RUSSIA (3:3:0) Introductory survey, including political, social, economic, and cultural development of Kievan, Muscovite, and Imperial Russia.
142. (DS) HISTORY OF COMMUNISM (3:3:0) Marxism; Leninism and evolution of the Soviet Union; formation and development of the communist bloc; impact of Chinese Communism.
143. (DH) HISTORY OF FASCISM AND NAZISM (3:3:0) The study of right-wing totalitarianism in the twentieth century, with special emphasis on Fascist Italy and Nazi Germany.
144. THE WORLD AT WAR: 1939-1945 (3:3:0) In-depth study of the origins and conduct of World War II. Political and economic aspects as well as military.
150. COLONIAL PENNSYLVANIA (3:3:0) Development of the colony of Pennsylvania through the war for American independence, covering immigration, economics, politics, religion, and society.
151. (DS) TECHNOLOGY AND SOCIETY IN AMERICAN HISTORY (3:3:0) Development of technology in America from colonial times; its reception and its influence on social, economic, and political life.
152. (DH) THE AFRO-AMERICAN EXPERIENCE (3:3:0) African roots; colonial and revolutionary experiences; slavery and abolitionism; Civil War and reconstruction; accommodation and protest; the new militancy.
154. HISTORY OF WELFARE IN AMERICA (3:3:0) History of the care of dependent people (including children, the aged, mentally ill, unemployed) from colonial times to the present.
155. (DS) AMERICAN BUSINESS HISTORY (3:3:0) The development of business from the planting of the colonies, through the stages of industrialization, to the present.
156. (L I R) HISTORY OF THE AMERICAN WORKER (3:3:0) A study of the American worker from the preindustrial era to the present.
158. HISTORY OF AMERICAN IMMIGRATION (3:3:0) The waves of migration to America and an analysis of the resulting minority groups, their reception, assimilation, and persisting identity.
173. (DS;DE) VIETNAM AT WAR (3:3:0) Rise of nationalism and communism: origins of conflict; United States involvement; impact on postwar regional and international politics; contemporary Vietnam.
174. (DH;DF) THE HISTORY OF TRADITIONAL EAST ASIA (3:3:0) Comparative cultural, institutional, and social history of traditional China and Japan to their contact with the industrialized West.
175. (DH;DF) THE HISTORY OF MODERN EAST ASIA (3:3:0) Comparative survey of the internal developments and external relations of China and Japan since their contact with the industrialized West.
178. (DH) LATIN AMERICAN HISTORY TO 1820 (3:3:0) Conquest of the New World, development of colonial institutions, impact on native cultures, and origins of independence movements.
179. (DH) LATIN AMERICAN HISTORY SINCE 1820 (3:3:0) Origin, political growth, international relations, and economic status of the Latin American republics, with emphasis upon present-day conditions.
181. (DH;DF) INTRODUCTION TO THE MIDDLE EAST (3:2:2) Origins of Islamic civilization; expansion of Islam; the Ottoman Empire; the Middle East since 1918.
187. HISTORY FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
191. (DH) EMERGING AFRICA (3:3:0) Indigenous African societies; impact of Rome, Islam, and Europe; slave trade; colonialism; nationalism; problems since independence.

HOTEL, RESTAURANT, AND INSTITUTIONAL MANAGEMENT (HR&IM)

201. INTRODUCTION TO MANAGEMENT IN THE HOSPITALITY INDUSTRY (2:2:0) Exploration and analysis of management opportunities, functions, methods, and concepts in various segments of the hospitality industry. Concurrent: HR&IM 202.
202. COLLOQUIUM IN HOSPITALITY MANAGEMENT (1-4) Major industry and professional speakers lecture on current issues followed by discussion with students and faculty. Prerequisite or concurrent: HR&IM 201.
204. HOTEL AND RESTAURANT MARKETING AND MERCHANDISING (3:3:0) Merchandising and marketing as a system concerned with motivating consumers to purchase hospitality products and services. This course will not meet the prescribed requirements for the HR&IM major in any option.

HUMAN DEVELOPMENT

250. QUANTITY FOOD PRODUCTION ANALYSIS (4:3:2) Physical characteristics of principal food product groups considered. Topics include purchasing problems, preparation techniques, quality and cost control. This course will not meet the prescribed requirements for the HR&IM major in any option.

260. HOSPITALITY SUPERVISION SEMINAR (4) Hospitality management topics are discussed with a major emphasis on operations management. This course will not meet the prescribed requirements for the HR&IM major in any option. Prerequisites: HR&IM 204, 301, 310, 380. Prerequisite or concurrent: HR&IM 250.

270. HOSPITALITY ADMINISTRATION SEMINAR (4) Components of food service systems are identified and studied as separate problems and as a total system. This course will not meet the prescribed requirements for the HR&IM major in any option. Prerequisite: HR&IM 260.

295. ANALYSIS OF FIELD EXPERIENCE I (2:2:0) Directed written and oral analysis of the 500-hour hospitality working experience focusing on the physical and social environment.

301. INTRODUCTION TO THE MANAGEMENT OF SERVICE OPERATIONS (3:3:0) An introduction to management principles and concepts used in service operations.

310. FOOD AND BEVERAGE PURCHASING AND SANITATION (3:3:0) Food and beverage purchasing and sanitation principles for hospitality operations.

319. INTRODUCTION TO FACILITIES PLANNING AND MAINTENANCE (3:3:0) The fundamental principles of facilities planning, facilities management, and maintenance for all segments of the hospitality industry. Prerequisite: HR&IM 301.

320. PROPERTY AND PHYSICAL PLANT MANAGEMENT (3:3:0) Analysis and management of engineering and maintenance systems, including mechanical, electrical, building, environmental, and energy management. Prerequisite or concurrent: HR&IM 201.

337. FOOD, BEVERAGE, AND LABOR COST CONTROL (3:3:0) Techniques for analyzing and controlling food, beverage, and labor costs in hospitality organizations. Prerequisite: ACCTG 200.

380. LODGING SYSTEMS MANAGEMENT I (3:3:0) Systems analysis, design, and application for hotel functions, including guest services, reservations, reception, telecommunications, guest-city ledger, and the night audit. Prerequisite: ACCTG 200. Prerequisite or concurrent: HR&IM 201.

381. LODGING SYSTEMS MANAGEMENT II (3:3:0) Systems analysis, design, and application for security, housekeeping, and laundry operations management, with additional emphasis on physical design. Prerequisite: HR&IM 380.

HUMAN DEVELOPMENT (H DEV)

100. INTRODUCTION TO HUMAN DEVELOPMENT (1:1:0) Human development as a process of man-environment transactions, and the relationships of various fields to the study of that process.

102. POLICY AND PLANNING FOR HUMAN DEVELOPMENT (3:3:0) Multidisciplinary analysis of concepts and practice in the creation and administration of social interventions for human development.

200. (HD FS) EMPIRICAL INQUIRY IN HUMAN DEVELOPMENT (3:2:2) Introduction to methods and philosophy of empirical inquiry applied to problems of human development.

395. FIELD PROJECTS (1-12) Independent study and research in a human service program; written and oral summary of rationale, procedures, findings.

HUMAN DEVELOPMENT AND FAMILY STUDIES (HD FS)

129. (GS;DE) INTRODUCTION TO HUMAN DEVELOPMENT AND FAMILY STUDIES (3:3:0) Introduction to psychosocial and family development at all stages of the individual and family life cycle.

200. (H DEV) EMPIRICAL INQUIRY IN HUMAN DEVELOPMENT (3:2:2) Introduction to methods and philosophy of empirical inquiry applied to problems of human development.

216. (DS) PERSONAL AND INTERPERSONAL SKILLS (2:2:0) Conceptions of life-span personal and interpersonal skill enhancement.

218. FOUNDATIONS OF MARRIAGE (3:3:0) Factors influencing the husband/wife relationship across the life course.

219. FAMILY FINANCIAL MANAGEMENT (3:3:0) How families plan their finances and factors that determine their decisions.

229. (DS) INFANT AND CHILD DEVELOPMENT (3:3:0) Theory, research, and methods of social/behavioral/biological sciences related to developmental processes and interventions during infancy and childhood.

239. (DS) ADOLESCENT DEVELOPMENT (3:3:0) Social, behavioral, and biological development and intervention throughout adolescence.

249. (DS) ADULT DEVELOPMENT AND AGING (3:3:0) Physiological, psychological, and social development and intervention from young adulthood through old age.

297. SPECIAL TOPICS (1-9)

311. INDIVIDUAL AND FAMILY INTERVENTIONS (3:3:0) Survey of individual and family formal and informal intervention efforts; historical and current perspectives and approaches. Prerequisites: HD FS 129 GS;DE; 3 credits in social, behavioral, or biological sciences.

315. (DF); 315W. (DF) FAMILY DEVELOPMENT (3:3:0) Family functions over the life course: family from a multidisciplinary perspective. Prerequisites: HD FS 129 GS;DE; 3 credits in social, behavioral, or human biological sciences.

327. HUMAN DEVELOPMENT ACROSS THE LIFE SPAN (3:3:0) A review of research and theory on human development across the life span from a multidisciplinary perspective. Prerequisites: HD FS 129 GS;DE; 3 credits in social, behavioral, or human biological sciences.

330. OBSERVATION OR EXPERIENCE WITH PRESCHOOL CHILDREN (3:1:4) Directed observations of, or supervised experience with, preschool children in group or home settings. Prerequisite: HD FS 229 DS or PSY 213 DS.

HUMANITIES (HUMAN)

001. (GH) VALUES OF THE WESTERN CULTURAL HERITAGE (3:3:0) Fundamental values of human experience as expressed in outstanding philosophical and literary works.

002. (GH) SHAPING OF THE MODERN MIND (3:3:0) Relevance to the present age of influential literary and philosophical texts illustrative of the principal epochs of Western civilization.

021. (DH) IDEAS AND ARTS (3:3:0) Interaction of intellectual and aesthetic values from the Renaissance to the present.

050. (DH) THE LITERATURE AND LORE OF MINING (3:3:0) Experience and values of mining tradition: survey of the literature and lore, including field research.

088. (DH) AUSTRALIAN/NEW ZEALAND CULTURAL PERSPECTIVES (3:3:0) Australian and New Zealand cultural and social perspectives, with emphasis on the historical development of intellectual, aesthetic, and humanistic values.

101. (DH) MODERN SCIENCE AND HUMAN VALUES (3:3:0) Relationships of science to the aspirations, values, and arts of man.

102. THE GRAND TOUR: A VISUAL SURVEY OF EUROPEAN HISTORY (3:3:0) A historical interdisciplinary examination of the visual heritage of Italy, France, Germany, Spain, and the British Isles.

187. HUMANITIES FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

INDUSTRIAL ENGINEERING (I E)

315. INDUSTRIAL ORGANIZATION AND ADMINISTRATION (3:3:0) Fundamental principles of organization leading to intelligent appreciation of the simpler problems of factory organization and operation. Students registered in Industrial Engineering may not schedule this course.

INDUSTRIAL ENGINEERING TECHNOLOGY (IE T)

101. MANUFACTURING MATERIALS, PROCESSES, AND LABORATORY (3:2:3) Mechanical properties of materials; primary processing methods used in manufacturing; ferrous and nonferrous metals; dimensional verification and measurements; mechanical properties evaluation; laboratory methods; statistical interpretation of data.

105. ECONOMICS OF INDUSTRY (2:2:0) Internal economics of industrial enterprise, cost factors, and methods of comparing alternate proposals.

109. INSPECTION AND QUALITY CONTROL (3:2:2) Inspection methods and procedures and their applications to control and acceptance sampling based on statistical methods. Prerequisite: MATH 087 GQ.

212. MANUFACTURING PROCESSES (2:0:6) Technology related to metal removal, material joining, casting, nondestructive testing; heat-treating, engineering measurements, and computer applications in manufacturing. Prerequisite: IE T 101.

215. PRODUCTION DESIGN (3:1:4) Planning and design of tools required for production. Study of advanced technologies in manufacturing, including CNC, robotics, CAD, and CAM. Prerequisites: EG T 201, IE T 212.

297. SPECIAL TOPICS (1-9)

INSURANCE

INSURANCE (INS)

102. PERSONAL INSURANCE PLANNING (3:3:0) Introduction to the principles and practices of personal insurance planning. May not be scheduled by Smeal College of Business Administration students. Prerequisite: third-semester standing.

301. RISK AND INSURANCE (3:3:0) Introduction to the principles and methods of handling business and personal risks; emphasis on insurance techniques. Prerequisite: fourth-semester standing.

INTERNATIONAL AGRICULTURE (INTAG)

100. (DS;DF) INTRODUCTION TO INTERNATIONAL AGRICULTURE (3:3:0) Survey of agriculture and food production in developing countries; socioeconomic and technical considerations.

INTERNATIONAL UNDERSTANDING (INT U)

200. (DS) INTERNATIONAL UNDERSTANDING AND WORLD AFFAIRS (3:3:0) Interdisciplinary consideration of international problems, conflict and accommodation; impact of various cultures and ideologies on world affairs and foreign policy. Credit will not be given for both this course and PL SC 014 GS. Prerequisite: third-semester standing.

ITALIAN (IT)

001. ELEMENTARY ITALIAN I (4:3:2) For beginners. Grammar, with reading and writing of simple Italian; oral and aural work stressed.

002. ELEMENTARY ITALIAN II (4:3:2) Grammar and reading continued; oral and aural phrases progressively increased; composition. Prerequisite: IT 001.

003. INTERMEDIATE ITALIAN (4:3:2) Advanced grammar; oral and written composition; reading of modern authors; Italian life and culture. Prerequisite: IT 002.

130. (GH;DF) ITALIAN CULTURE AND CIVILIZATION (3:3:0) Italian life from the medieval period to the present: literature, arts, and contemporary problems; Italo-American experience. (In English.)

187. ITALIAN FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

230. (DH) MASTERPIECES OF ITALIAN LITERATURE IN ENGLISH TRANSLATION (3:3:0) Emphasis on works and authors of international importance. Lectures, readings, and written work in English.

JAPANESE (JAPNS)

001. ELEMENTARY JAPANESE I (4:3:2) Introduction to modern Japanese; development of audio-lingual facility and ability to read and write Japanese without aid of romanization.

002. ELEMENTARY JAPANESE II (4:3:2) Continuation of elementary Japanese, with emphasis on improving audio-lingual facility and strengthening reading and writing skills in modern Japanese. Prerequisite: JAPNS 001.

003. INTERMEDIATE JAPANESE (4:3:2) Continued study of modern Japanese at the intermediate level; extensive audio-lingual practice for conversational fluency; reading/writing original scripts. Prerequisite: JAPNS 002.

110. CONVERSATION, READING, AND COMPOSITION (3:3:0) Readings in selected Japanese literature and other texts; practice in conversation and composition. Prerequisite: JAPNS 003.

199. (DF) FOREIGN STUDY—BASIC JAPANESE (1–8) Small-group instruction in spoken and written modern Japanese at the introductory level.

299. (DF) FOREIGN STUDY—INTERMEDIATE JAPANESE (1–12) Small-group instruction in spoken and written Japanese at the intermediate level. Prerequisite: JAPNS 002.

296. INDEPENDENT STUDIES (1–18)

297. SPECIAL TOPICS (1–9)

LABOR AND INDUSTRIAL RELATIONS (L I R)

100. (DS) INDUSTRIAL RELATIONS (3:3:0) Introductory analysis of the employment relationship and of the interrelated interests of management, workers, unions, and the public.

101. (DS) EMPLOYMENT RELATIONSHIP: LAW AND POLICY (3:3:0) An examination of basic legal principles underlying the employment relationship and their social, political, and economic bases.

104. (DS) THE PRACTICE OF COLLECTIVE BARGAINING (3:3:0) Study of the factors involved in negotiating labor contracts, the issues, processes, bargaining relationships, and public responsibilities facing the parties.

156. (HIST) HISTORY OF THE AMERICAN WORKER (3:3:0) A study of the American worker from the preindustrial era to the present.

296. INDEPENDENT STUDIES (1-18)

LANDSCAPE ARCHITECTURE (LARCH)

* 003. (GA) THE NATURAL AND HISTORIC LANDSCAPE (3:3:0) Changing attitudes toward urban and rural outdoor spaces and their aesthetic and cultural value.

* 060. (GA) HISTORY OF LANDSCAPE ARCHITECTURE (3:3:0) A survey of the historical development of outdoor space in relationship to allied arts from early beginnings to this century.

LANGUAGE AND LITERACY EDUCATION (LL ED)

005. COLLEGE READING IMPROVEMENT I (3:3:0) Improvement of basic reading skills: vocabulary development; literal and interpretative comprehension; application of these skills more efficiently into college work. Prerequisite: limited to students whose academic profile sheets indicate help in reading is needed.

010. COLLEGE READING IMPROVEMENT II (3:3:0) Development of higher-level comprehension, vocabulary, and study skills incorporated into content area reading. Prerequisite: LL ED 005.

LATIN (LATIN)

001. ELEMENTARY LATIN (4:3:2) Pronunciation; inflections; simple rules of syntax.

002. ELEMENTARY LATIN (4:3:2) Advanced syntax and sentence structure. Prerequisite: LATIN 001.

003. INTERMEDIATE LATIN (4:3:2) Selected readings from representative authors. Prerequisite: LATIN 002.

297. SPECIAL TOPICS (1-9)

LIBRARY STUDIES (L ST)

110. INFORMATION ORGANIZATION AND RETRIEVAL (3:2:2) Information structure and resources related to search and problem-solving procedures to identify, organize, and locate print and nonprint materials. Prerequisite: ENGL 015 GWS;DEX or 030 GWS;DEX.

LINGUISTICS (LING)

001. (GS) THE STUDY OF LANGUAGE (3:3:0) A nontechnical introduction to the study of human language and its role in human interaction. Students who have successfully completed LING 100 may not enroll in LING 001 GS.

100. FOUNDATIONS OF LINGUISTICS (3:3:0) Systematic study of linguistic structures in a variety of the world's languages; an overview of language and its organization.

102. (DH) INTRODUCTION TO HISTORICAL LINGUISTICS (3:3:0) Language change and linguistic reconstruction; general procedures and techniques used in comparative linguistics; models of languages; linguistic borrowing and influence. Prerequisite: LING 010 or 100.

220. (DS) (PSY) INTRODUCTION TO PSYCHOLINGUISTICS (3:3:0) The learning of language; language development in the child; meaning as a problem for psychology. Prerequisite: PSY 002 GS.

MANAGEMENT (MGMT)

100W. SURVEY OF MANAGEMENT (3:3:0) Introduction to organizational factors relevant to management processes, including leadership, motivation, job design, technology, organizational design and environments, systems, change.

150. SUPERVISORY MANAGEMENT (3:3:0) Preparation for supervisory positions in formal organizations. Emphasis placed on the motivational aspects of the supervisor's job. Prerequisite: MGMT 100.

*Students may take only one course for General Education credit from LARCH 003 GA or 060 GA.

MANAGEMENT INFORMATION SYSTEMS (M I S)

100. INTRODUCTION TO MANAGEMENT INFORMATION SYSTEMS (3:3:0) Business computer systems and their impact on management decision making. A student may not receive credit toward graduation for both M I S 100 and 301.

101. MICROCOMPUTER PROGRAMMING IN STRUCTURED BASIC (3:3:0) Introduction to the microcomputer algorithmic process using BASIC as the vehicle to construct computer solutions to common problems.

103. MICROCOMPUTER APPLICATIONS IN BUSINESS (3:3:0) Introduction to current business uses of the microcomputer, including spreadsheets, data base management, word processing, and decision-making models.

106. SPECIALIZED MICROCOMPUTER APPLICATIONS IN BUSINESS (1-6) Use of the microcomputer in the functional areas of business (e.g., accounting, management, marketing, finance, etc.). Prerequisites: 3 credits in a business administration appropriate functional area; prior written approval of department.

110. INTRODUCTION TO COBOL (3:3:0) Fundamentals of structured COBOL programming. Prerequisite: M I S 100.

111. ADVANCED COBOL (3:3:0) Advanced structured COBOL programming. Prerequisite: M I S 110.

MANAGEMENT SCIENCE AND INFORMATION SYSTEMS (MSIS)

200. INTRODUCTION TO STATISTICS FOR BUSINESS (4:4:0) Introduction to business statistics, including topics in probability theory, sampling, inference, quality assurance, regression, forecasting, and simulations. Prerequisite: CMPSC 203 GQ, MATH 018 GQ, 110 GQ, or 140 GQ.

201. QUANTITATIVE METHODS FOR BUSINESS DECISIONS (3:3:0) Introduction to quantitative methods for conceptualizing business and management problems. Prerequisite: MATH 018 GQ, 021 GQ, 110 GQ, or 140 GQ.

MARKETING (MKTG)

* 150. PROMOTION MANAGEMENT (3:3:0) The application and management of various forms of persuasive communication with potential customers; advertising, publicity, personal selling, sales promotion. Prerequisite: MKTG 221.

* 160. PRINCIPLES OF RETAILING (3:3:0) Introduction to the management of retailing organizations with emphasis on decision making. Prerequisite: MKTG 221.

* 180. PRINCIPLES OF BUSINESS MARKETING (3:3:0) Introduction to the management of business-to-business marketing strategy. Emphasizes strategic response to industrial marketing opportunities and response to competition. Prerequisite: MKTG 221.

* 190. INTRODUCTION TO MARKETING RESEARCH (3:3:0) Practical aspects of marketing research, with emphasis on practical details of operating a small-scale project. Prerequisites: MKTG 221, MSIS 201.

220. PERSONAL SELLING (3:3:0) Principles underlying the sales process and practical application of these principles to selling situations. Studies role of selling in total marketing process. Prerequisite: third-semester standing.

221. CONTEMPORARY AMERICAN MARKETING (3:3:0) Social and economic aspects; movement of goods and services from producers to consumers; analysis of marketing functions, systems, and institutions. A student may not receive credit toward graduation for both MKTG 221 and 301. Prerequisite: 3 credits in economics.

MATERIALS ENGINEERING TECHNOLOGY (MAT T)

200. MATERIALS LABORATORY PRACTICE (3:1:4) Introduction to the methods used to prepare microstructures of various materials, measure elevated temperature, and perform physical property tests. Prerequisites: CHEM 012 DN, PHYS 150 DN.

201. PHYSICAL ANALYSIS OF MATERIALS (3:2:2) A study of the structures in several classes of materials, manipulation of these structures, and the behavior of these materials. Prerequisites: CHEM 014 DN, MATH 087 GQ, MAT T 200.

202. MATERIALS TESTING (3:1:4) Instruction in the methods used for the mechanical property testing of materials including test specimen design, procedures, and the statistical evaluation of data. Prerequisite: MATH 087 GQ.

* Smeal College of Business Administration courses numbered 150-199 are not acceptable for the B.S. degree in business at the University Park Campus.

203. MATERIALS PRODUCTION AND PROCESSING I (3:2:2) Analysis of important materials—production from raw sources, processing into usable forms, and their ranges of physical and mechanical properties. Prerequisites or concurrent: MAT T 200, MAT T 202.

204. MATERIALS PRODUCTION AND PROCESSING II (3:2:2) A study of materials from their production, processing, and property selection aspects with visits to several materials-related plants. Prerequisites: MAT T 200, 202.

295. FIELD PRACTICE (3:1:6) Practical experience in the materials industries through either a work assignment or completion of a cooperative project with a company.

Note: These courses are deemed to be of sufficient depth that graduates from the MAT T program may pursue studies in most baccalaureate materials-related programs.

MATERIALS SCIENCE (MATSC)

101. (GN) ENERGY AND FUELS IN SOCIETY (3:3:0) Energy utilization and technological development; energy resources; energy conversion; patterns, problems, and trends in human use of energy. For nontechnical students.

MATHEMATICS (MATH)

004. INTERMEDIATE ALGEBRA (3:3:0) Algebraic expressions; linear, absolute value equations and inequalities; lines; systems of linear equations; integral exponents; polynomials; factoring. This course may not be used to satisfy the basic minimum requirements for graduation in any baccalaureate degree program. Prerequisite: MATH 003 or satisfactory performance on the mathematics proficiency examination.

017. (GQ) FINITE MATHEMATICS (3:3:0) Introduction to logic, sets, probability. Prerequisite: 2 units of high school mathematics.

018. (GQ) ELEMENTARY LINEAR ALGEBRA (3:3:0) Matrices and vectors; transformations; systems of linear equations; convex sets and linear programming. Prerequisite: 2 units of high school mathematics.

021. (GQ) COLLEGE ALGEBRA I (3:3:0) Quadratic equations; equations in quadratic form; word problems; graphing; algebraic fractions; negative and rational exponents; radicals. Prerequisite: MATH 004 or satisfactory performance on the mathematics proficiency examination.

022. (GQ) COLLEGE ALGEBRA II AND ANALYTIC GEOMETRY (3:3:0) Relations, functions, graphs; polynomial, rational functions, graphs; word problems; nonlinear inequalities; inverse functions; exponential, logarithmic functions; conic sections; simultaneous equations. Prerequisite: MATH 021 GQ.

026. (GQ) PLANE TRIGONOMETRY (3:3:0) Trigonometric functions; solutions of triangles; trigonometric equations; identities. Prerequisites: MATH 005 GQ or satisfactory performance on the mathematics proficiency examination; 1 unit of geometry.

035. (GQ;DEX) GENERAL VIEW OF MATHEMATICS (3:3:0) Survey of mathematical thought in logic, geometry, combinatorics, and chance.

036. (GQ) INSIGHTS INTO MATHEMATICS (3:3:0) Examples of mathematical thought in number theory, topology, theory of symmetry, and chance. Prerequisite: 1 unit of algebra or MATH 004.

087. (GQ) TECHNICAL MATHEMATICS (5:5:0) Algebraic expressions, exponents, radicals, equations, graphs, systems of equations, trigonometric functions, solution of right triangles, vectors, complex numbers. Prerequisite: MATH 004 or satisfactory performance on the mathematics proficiency examination.

088. (GQ) TECHNICAL MATHEMATICS AND CALCULUS (5:5:0) Logarithm, inverse trigonometric functions, trigonometric identities, inequalities, series, limits, differentiation, higher order derivatives, implicit differentiation, applications, integration, areas, volumes, differential equations. Prerequisite: MATH 087 GQ.

110. (GQ) TECHNIQUES OF CALCULUS I (4:4:0) Functions, graphs, derivatives, integrals, techniques of differentiation and integration, exponentials, improper integrals, applications. Students may take only one course for credit from MATH 110 GQ, 140 GQ, 140A GQ, 140B GQ, and 140L GQ. Prerequisite: MATH 022 GQ or satisfactory performance on the mathematics proficiency examination.

111. (GQ) TECHNIQUES OF CALCULUS-II (2:2:0) Analytic geometry, partial differentiation, maxima and minima, differential equations. Prerequisite: MATH 110 GQ.

140. (GQ) CALCULUS WITH ANALYTIC GEOMETRY I (4:4:0) Functions, limits; analytic geometry; derivatives, differentials, applications; integrals, applications. Students may take only one course for credit from MATH 110 GQ, 140 GQ, 140A GQ, 140B GQ, and 140L GQ. Prerequisites: MATH 022 GQ, 026 GQ; or MATH 040 GQ; or satisfactory performance on the mathematics proficiency examination.

140A. (GQ) CALCULUS, ANALYTIC GEOMETRY, ALGEBRA, AND TRIGONOMETRY (6:6:0) Review of algebra and trigonometry; analytic geometry; functions; limits; derivatives, differentials, applications; integrals, applications. Students may take only one course for credit from MATH 110 GQ, 140 GQ, and 140A GQ, 140B GQ, and 140L GQ. Prerequisite: satisfactory performance on the mathematics proficiency examination.

MECHANICAL ENGINEERING TECHNOLOGY

141. (GQ) CALCULUS WITH ANALYTIC GEOMETRY II (4:4:0) Derivatives, integrals, applications; sequences and series; analytic geometry; polar coordinates; partial derivatives. Students may take only one course for credit from MATH 141 GQ, 141B GQ, and 141L GQ. Prerequisite: MATH 140 GQ, 140A GQ, 140B GQ, or 140L GQ.
200. (GQ) NUMBER SYSTEMS (3:3:0) Introduction to sets and logic, properties of the natural numbers, integers, rational and real numbers, algorithms, applications to geometry. For elementary education students only.
220. (GQ) MATRICES (2:2:0) Systems of linear equations; matrix algebra; eigenvalues and eigenvectors; linear systems of differential equations. Prerequisite: MATH 110 GQ or 140 GQ.
230. CALCULUS AND VECTOR ANALYSIS (4:4:0) Three-dimensional analytic geometry; vectors in space; partial differentiation; double and triple integrals; integral vector calculus. Students who have passed either MATH 231 or 232 may not schedule MATH 230 for credit. Prerequisite: MATH 141 GQ.
231. CALCULUS OF SEVERAL VARIABLES (2:2:0) Analytic geometry in space; differential and integral calculus of several variables. Students who have passed MATH 230 may not schedule this course. Prerequisite: MATH 141 GQ.
232. INTEGRAL VECTOR CALCULUS (2:2:0) Multidimensional analytic geometry; potential fields; flux; Green's divergence and Stokes's theorem. Students who have passed MATH 230 may not schedule this course. Prerequisite: MATH 231.
250. ORDINARY DIFFERENTIAL EQUATIONS (3:3:0) First- and second-order equations; special functions; Laplace transform solutions; higher order equations. Students who have passed MATH 251 may not schedule this course for credit. Prerequisite: MATH 141 GQ.
251. ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS (4:4:0) First- and second-order equations; special functions; Laplace transform solutions; higher order equations; Fourier series; partial differential equations. Prerequisite: MATH 141 GQ.
800. BUSINESS MATHEMATICS (3:3:0) Operations with whole numbers, fractions, and mixed numbers, decimals and percent, formulas and equations; percentages and interest, introduction to algebra.

MECHANICAL ENGINEERING TECHNOLOGY (ME T)

100. MECHANISMS (2:0:4) Motion in machine elements; strength and properties of materials; design of machine elements. Prerequisite: MCH T 111.
105. KINEMATICS (3:2:3) Graphical/analytical studies of relative motions, instant centers, velocity/acceleration in plane motions, mechanisms, cams, gears, gear trains, and flexible connectors. Prerequisite: EG T 101, 102, MCH T 111.
206. MACHINE ELEMENTS AND DYNAMICS (3:2:2) Graphical and analytical study of motion in various mechanisms, including cams, gears, gear trains, and flexible connectors; introduction to kinetics. Prerequisites: EG T 101, MCH T 111. Concurrent: CMPSC 101 GQ.
207. HEAT TRANSFER (3:3:0) Basic principles of conduction, convection, and radiation, emphasizing practical applications.
- 210W. PRODUCT DESIGN USING WRITING SKILLS (3:2:3) Design machine elements including bearings, springs, levers, shafts, gears, belts, and small mechanical devices; writing skills and computer applications. Prerequisites: MCH T 213, ME T 105.
281. ELEMENTARY THERMO- AND FLUID DYNAMICS (4:4:0) Basic problems in compressible fluid flow. Laws of dynamics and thermodynamics, mechanical properties of fluids, elementary heat transfer. Prerequisite or concurrent: MATH 088 GQ, PHYS 150 DN.
282. AIR RESOURCE MANAGEMENT (2:2:0) Introduction to air pollution. Pollutants, sources, effects, air monitoring systems, air quality criteria and standards, governmental control programs and procedures.
284. SAMPLING AND MONITORING PROGRAM (2:0:4) Instrumentation and site selection, field data acquisition for major air pollutants, data analysis and evaluation.
297. SPECIAL TOPICS (1-9)

MECHANICAL TECHNOLOGY (MCH T)

111. MECHANICS FOR TECHNOLOGY: STATICS (3:3:0) Forces; moments; resultants; two- and three-dimensional equilibrium of force systems; friction; centroids and moments of inertia of areas. Prerequisite MATH 087 GQ. Prerequisite or concurrent: CMPSC 101 GQ.
212. INTRODUCTION TO DYNAMICS (3:2:2) Absolute and relative motion related to particles and simple linkages. Force-mass-acceleration, work-energy, and impulse-momentum solution techniques. Prerequisite: MCH T 111. Prerequisite or concurrent: MATH 088 GQ.
213. STRENGTH AND PROPERTIES OF MATERIALS (3:3:0) Axial stress and strain; shear; torsion; beam stresses and deflections; combined axial and bending stresses; columns, ductility, resilience, and toughness. Prerequisite: MCH T 111. Concurrent: CMPSC 101 GQ.

214. STRENGTH AND PROPERTIES OF MATERIALS LABORATORY (1:0:2) Measurement of mechanical properties of materials; structural testing, data acquisition and analysis; technical laboratory report writing. Concurrent: MCH T 213.

MEDIEVAL STUDIES (MEDVL)

107. (DH) (HIST) MEDIEVAL EUROPE (3:3:0) Rise and development of the civilization of medieval Europe from the decline of Rome to 1500.

108. (DH) MEDIEVAL CIVILIZATION (3:3:0) An interdisciplinary introduction to literature, art, and thought of the Middle Ages.

187. MEDIEVAL STUDIES FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

METEOROLOGY (METEO)

002. (GN) WEATHER AND SOCIETY (2:2:0) Nontechnical treatment of fundamentals of modern meteorology; effect of weather and climate on society and its activities. A student who took METEO 003 GN for more than 1 credit may not take this course.

003. (GN) INTRODUCTORY METEOROLOGY (3:2:2) Nontechnical treatment of fundamentals of modern meteorology; effect of weather and climate on man and his activities. A student who took METEO 002 GN may take the laboratory part of this course for 1 credit only.

MICROBIOLOGY (MICRB)

106. (GN) ELEMENTARY MICROBIOLOGY (3:3:0) Importance of microorganisms in public health and disease, agriculture, and industry; descriptive course for nontechnical students.

107. (GN) ELEMENTARY MICROBIOLOGY LABORATORY (1:0:3) Selected techniques with regard to recognition and enumeration of bacteria; effects of chemical and physical agents on microorganisms. Prerequisite or concurrent: MICRB 106 GN.

120. INSTRUMENTAL METHODS OF BIOLOGICAL ANALYSIS (4:2:6) The application of selected instruments for obtaining qualitative and quantitative data in life sciences laboratories. Prerequisites: CHEM 013 DN, 015 DN, MICRB 201, 202, admission to Biotechnology option of 2-Science program.

121A. TISSUE CULTURE/MONOCLONAL ANTIBODY PREPARATION (3:0:6) Exercises demonstrating principles of plant and animal tissue culture and monoclonal antibody preparation. Prerequisite: MICRB 120.

121B. RECOMBINANT AND DNA TECHNIQUES (3:0:6) Exercises demonstrating processes of genetic transfer, isolation of recombinants, purification and analysis of genetic components. Prerequisite: MICRB 120.

150. INTRODUCTORY MEDICAL LABORATORY TECHNOLOGY (4:2:10) Introduction to basic principles and procedures of clinical laboratory work. Practicum emphasizes proper collection, handling, and preparation of biological samples. Prerequisite: admission to 2-MLT program.

151A. SEMINAR AND PRACTICUM FOR MEDICAL LABORATORY TECHNICIANS—CLINICAL CHEMISTRY (7) Basic principles and procedures for measuring chemical components of blood and other body fluids. Prerequisites: MICRB 150, 201, 202, CHEM 034, BIOL 041 DN.

151C. SEMINAR AND PRACTICUM FOR MEDICAL LABORATORY TECHNICIANS—HEMATOLOGY (6) Red and white blood cell identification and enumeration. Related procedures for diagnosing normal or disease states. Prerequisites: MICRB 150, 201, 202, CHEM 034, BIOL 041 DN.

151D. SEMINAR AND PRACTICUM FOR MEDICAL LABORATORY TECHNICIANS—IMMUNOHEMATOLOGY (4) Immunologic considerations necessary for the transfusion of blood and blood products. Prerequisites: BIOL 041 DN, CHEM 034, MICRB 150, 201, 202.

151E. SEMINAR AND PRACTICUM FOR MEDICAL LABORATORY TECHNICIANS—URINALYSIS (2) Identification of cellular and crystalline urinary sediments. Qualitative chemical analysis of urine. Prerequisites: MICRB 150, 201, 202, CHEM 034, BIOL 041 DN.

151F. SEMINAR AND PRACTICUM FOR MEDICAL LABORATORY TECHNICIANS—IMMUNOLOGY/SEROLOGY (2) Antigen-antibody interactions of diagnostic importance; methods used to identify and quantify antigen-antibody complexes. Prerequisites: BIOL 041 DN, CHEM 034, MICRB 150, 201, 202.

151W. SEMINAR AND PRACTICUM FOR MEDICAL LABORATORY TECHNICIANS—CLINICAL MICROBIOLOGY (6) Properties of normal and abnormal microbial flora and procedures for diagnosing normal or disease states. Prerequisites: BIOL 041 DN, CHEM 034, MICRB 150, 201, 202.

201. INTRODUCTORY MICROBIOLOGY (3:3:0) Elementary principles of microbial and viral interrelationships, morphology, and physiology; relation to food, water, soil, industry, and disease processes. Designed for students in technical majors.

MINING

202. INTRODUCTORY MICROBIOLOGY LABORATORY (2:0:4) Qualitative and quantitative techniques with regard to recognition of bacteria and their processes on a microscopic, colonial, and physiological basis. Prerequisite: CHEM 012 DN. Prerequisite or concurrent: MICRB 201.

231. (BIOL) CELL BIOLOGY (3:3:0) Fundamental cellular, subcellular, and molecular characteristics of cells. Prerequisites: BIOL 101 DN, CHEM 012 DN.

MINING (MNG)

023. MINERAL LAND AND MINE SURVEYING (2:0:6) Surveying theory and practice applied to mineral lands and mines; traversing, leveling, mapping, underground surveying, microcomputer drafting and graphics. Prerequisites: E G 010, 1/2 unit of secondary school trigonometry.

030. INTRODUCTION TO MINING ENGINEERING (2:2:0) Examination, development, and exploitation of mineral deposits; mining methods; unit operations; mining equipment; fundamentals of explosives.

MUSIC (MUSIC)

Note: For a complete list of music courses designated for General Education, see the Penn State *Baccalaureate Degree Programs Bulletin*.

005. (GA) AN INTRODUCTION TO WESTERN MUSIC (3:3:0) A general survey of art music in Western society, highlighting important composers and stylistic developments.

008. (GA;DE) RUDIMENTS OF MUSIC (3:3:0) Introduction to the elements of music: notation, scales, meter, rhythm, intervals; basic chord structure. For nonmusic majors.

NUCLEAR ENGINEERING TECHNOLOGY (NE T)

201. APPLIED RADIOLOGICAL SAFETY (3:3:0) Discussion of basic radiation dose units, radiation dosimetry, biological effects of radiation, radiation monitoring techniques, government regulations, and radwaste management. Concurrent: NE T 202.

202. REACTOR TECHNOLOGY I (4:4:0) Atomic and nuclear structure, electromagnetic radiation, nuclear radiations, nuclear interactions, and fission. Prerequisite: MATH 088 GQ. Concurrent: PHYS 151.

203. APPLIED THERMODYNAMICS (3:3:0) Fundamentals based on first and second laws of thermodynamics; properties of pure substances; vapor cycles for power generation. Prerequisite: MATH 088 GQ. Concurrent: PHYS 151.

204. REACTOR TECHNOLOGY II (3:3:0) Survey of various reactor types; neutron diffusion, steady state reactor theory and applications; kinetic behavior of reactors. Prerequisite: NE T 202.

205. NUCLEAR TECHNOLOGY LABORATORY I (2:1:2) Study of radiological safety, radiation measurements, radiation detection instrumentation, and radioactive decay. Concurrent: NE T 201, PHYS 151.

212. NUCLEAR TECHNOLOGY LABORATORY II (3:1:3) Laboratory study of radiation measurements and the diversified application of nuclear techniques and detection systems. Prerequisites: NE T 201, 205.

214. REACTOR TECHNOLOGY LABORATORY (3:1:4) Simulator study of various reactor components and safety systems; emphasis placed upon reactor operation. Prerequisites: NE T 202. Concurrent: NE T 204.

215. APPLIED HEAT TRANSFER (3:3:0) Basic principles of conduction, convection, and radiation. Emphasis placed on nuclear fuel heat removal. Prerequisite: NE T 202. Concurrent: NE T 204.

220. ELECTRICAL GENERATION ORIENTATION (1:1:0) Introduction and comparison of methods of generating electricity; description of the variety of occupations in the electrical generating industry.

221. INTRODUCTORY BOILING WATER REACTOR TECHNOLOGY (1:1:0) Introduction to the concept of commercial power generation of electricity through the use of a boiling water reactor.

222. POWER PLANT QUALITY ASSURANCE/QUALITY CONTROL (1:1:0) Introduction to concepts of quality assurance/quality control; historical development of standards and regulatory guides; specific applications to nuclear plants.

297. SPECIAL TOPICS (1-9)

NURSING (NURS)

101. NURSING I (8:4:12) Introduction to associate degree nursing roles and nursing process; emphasis on individual health patterns and selected nursing interventions. Prerequisite or concurrent: BIOL 041 DN, 042, HD FS 129 GS.

102. NURSING II (8:4:12) Common and well-defined health problems with integrated nursing content; emphasis on infancy through young adulthood and mental health nursing. Prerequisite: NURS 101.

201. NURSING III (9:4:15) Develop expanding competencies in caring for clients with dysfunctional health patterns; emphasis on middle-age adults and perioperative nursing care. Prerequisite: NURS 102.
- 202W. NURSING IV (10:5:15) Emphasis on care of older adults with complex emotional or physical dysfunctional health patterns while developing skill in utilizing the nursing process. Prerequisite: NURS 201.

NUTRITION (NUTR)

100. (GHS) CONTEMPORARY NUTRITION CONCERNS (1:1:0) Interpretation of nutrition principles in relation to contemporary problems in selecting food for growth, development, and health. Students who have received credit for NUTR 150 or 251 GHS may not schedule this course.
151. NUTRITION COMPONENT OF THE FOOD SERVICE SYSTEM (3:3:0) Introduction to basic nutrition principles and their application in a food service system. Students who have taken NUTR 150 or 251 GHS may not schedule this course.
251. (GHS) INTRODUCTORY PRINCIPLES OF NUTRITION (3:3:0) The nutrients: food sources and physiological functions as related to human growth and well-being throughout life; current nutrition issues. Students who have passed NUTR 150 may not schedule this course.
252. DIET THERAPY AND NUTRITION CARE IN DISEASE (4:3:2) Principles of nutrition care to meet therapeutic needs, inpatient care, and rehabilitation. Prerequisites: NUTR 151 or 251 GHS.
359. NUTRITION ASSESSMENT THEORY AND PRACTICE (2:1:2) Introduction to purpose, methods, and scientific basis for assessment of nutritional status and use of tools in a practice setting. Prerequisite: NUTR 151 or 251 GHS.

OCCUPATIONAL THERAPY (O T)

101. INTRODUCTION TO OCCUPATIONAL THERAPY (3:3:0) An introduction to the occupational therapy profession. Observation of therapists in treatment settings. Prerequisite: ENGL 015 GWS;DEX.
103. ACTIVITY ANALYSIS: DAILY LIVING SKILLS (3:2:2) Analysis of physical limitations that hinder independent performance of self-care, leisure, and work. Methods to enable performance. Prerequisite: O T 101.
105. ACTIVITY ANALYSIS: GROUP INTERACTION SKILLS (3:2:2) Group interaction observed and analyzed. Activities to facilitate and enhance interactions practiced. Prerequisite: O T 101, PSY 002 GS.
107. ACTIVITY ANALYSIS: THERAPEUTIC DEVICES (3:2:2) Therapeutic devices analyzed. Selection criteria, proper use, and precautions. Prerequisite: O T 101.
202. OCCUPATIONAL THERAPY FOR DEVELOPMENTAL DISABILITIES (2:2:0) Occupational therapy evaluation, intervention, documentation methods for developmental disabilities, observation of therapists in treatment settings. Prerequisite: HD FS 129 GS;DE, O T 103, 105, 107.
204. OCCUPATIONAL THERAPY FOR PSYCHOSOCIAL DYSFUNCTIONS (3:3:0) Occupational therapy evaluation, intervention, documentation, methods for psychosocial dysfunctions. Observation of therapists in treatment settings. Prerequisite: HD FS 129 GS, O T 103, 105.
206. OCCUPATIONAL THERAPY FOR PHYSICAL DISABILITIES (3:3:0) Occupational therapy evaluation, intervention, documentation methods for physical disabilities, observation of therapists in treatment settings. Prerequisite: BIOL 029, BIOL 041 DN, BIOL 042, O T 103, 107.
- 295A. FIELD EXPERIENCE IN OCCUPATIONAL THERAPY (12) Supervised experience in select occupational therapy settings in the role of an occupational therapy assistant. Seminars included. Prerequisite: satisfactory completion of first 3 semester course requirements.

OPERATIONS MANAGEMENT (OPMGT)

150. PRODUCTION AND OPERATIONS MANAGEMENT (3:3:0) Quantitative tools and techniques used in managing the production function of a firm, including inventory control, production scheduling, capacity planning. Prerequisite: MATH 021 GQ.

PHILOSOPHY (PHIL)

- * 001. (GH) BASIC PROBLEMS OF PHILOSOPHY (3:3:0) Issues such as the foundations of knowledge, the existence of God, the problem of freedom, and the nature of reality.
003. (GH) MORAL VALUES (3:3:0) Freedom, choice, and obligation in conduct; values and the foundations of ethics.
- * 004. (GH) MAJOR FIGURES IN PHILOSOPHY (3:3:0) Introduction to philosophy through the study of the writings of representative thinkers in the history of philosophy.

*Students may take only one course for General Education credit from PHIL 001 GH or 004 GH.

PHYSICAL SCIENCE

010. (GH) CRITICAL THINKING AND ARGUMENT (3:3:0) Principles of correct thinking; deductive and inductive inference; use and misuse of language in reasoning.
012. (GQ) ELEMENTS OF SYMBOLIC LOGIC (3:3:0) Translating arguments into symbolic form and establishing validity. For nonscience majors.
100. (DH) THE MEANING OF HUMAN EXISTENCE (3:3:0) A study of some philosophical ways of viewing the purpose of life, the good life, and history and its meaning.
102. (DH) EXISTENTIALISM (3:3:0) Exploration of a controversial modern mode of philosophizing about life, death, absurdity, and faith.
103. (DH) ETHICS AND SOCIAL ISSUES (3:3:0) Ethical issues such as war, privacy, crime and punishment, racism and sexism, civil liberties, affirmative action, abortion, and euthanasia.
104. (DH) ETHICS AND THE PROFESSIONS (3:3:0) The philosophical basis for the ethics of professional practice; illustrations include law, business, public administration, journalism, engineering, teaching, medicine.
105. INTRODUCTION TO THE PHILOSOPHY OF LAW (3:3:0) Topics normally include concepts of law and responsibility, justice and punishment, legal ethics, and the limits of law.
106. BUSINESS ETHICS (3:3:0) A study of ethical issues that confront the business community. Designed primarily for majors in The Smeal College of Business Administration.
108. (DH) SOCIAL AND POLITICAL PHILOSOPHY (3:3:0) Philosophical analysis of political and communal order; theories of individual and group action within the structures of social obligation.
109. (DH) PHILOSOPHY OF ART (3:3:0) Exploration of questions about aesthetic experience, creativity, theories of beauty, principles of criticism in the arts and literature.
110. (DH) CONSTRUCTION OF SCIENTIFIC CONCEPTS (3:3:0) The development of scientific concepts, and the relationship of scientific thought and culture.
111. (DH;DF) ORIENTAL PHILOSOPHY (3:3:0) Study of philosophical, aesthetic, and religious ideas in the classics of Eastern thought.
124. (DH) PHILOSOPHY OF RELIGION (3:3:0) Nature and development of Western religion with interpretation of its significance in contemporary culture. Prerequisite: third-semester standing.
187. PHILOSOPHY FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
205. (DH) ANCIENT PHILOSOPHY (3:3:0) The movements of thought and major thinkers from the pre-Socratics to the neo-Platonists; emphasis on Plato and Aristotle.
206. (DH) MODERN PHILOSOPHY (3:3:0) Thinkers from the Renaissance to Kant; empiricism, rationalism, critical philosophy; interaction of philosophy with the revolutions in science, religion, and politics.
207. (DH) MEDIEVAL PHILOSOPHY (3:3:0) The movements of thought and major thinkers from the fourth to the fifteenth centuries.
212. (GQ) SYMBOLIC LOGIC (3:3:0) The logic of propositions, relations, and quantification; the nature and properties of formal systems. Intended primarily for science-oriented students.
218. (DH) CONTEMPORARY PHILOSOPHY (3:3:0) Analysis of the present climate of philosophical thought and its relation to contemporary patterns of culture.
221. (DH;DEX) PHILOSOPHY OF SCIENCE (3:3:0) An inquiry into the form and function of concepts, laws, theories, and into the character of scientific explanation and prediction.

PHYSICAL SCIENCE (PH SC)

007. PHYSICAL SCIENCE (3:3:0) Development of physics, including modern physical concepts and their relationship to the careers of physical scientists. May not be scheduled by students who have received credit for PHYS 100, 201 DN, 215 DN, or 221 DN.
008. PHYSICAL SCIENCE (3:3:0) Selected concepts of chemistry showing their development, interrelationship, and present status. May not be scheduled by students who have received credit for CHEM 001 DN and 002 DN.

PHYSICS (PHYS)

001. (GN) THE SCIENCE OF PHYSICS (3:3:0) Historical development and significance of major concepts and theories, with emphasis on the nature of physical science and its role in modern life. For students in nontechnical fields.
150. (DN) TECHNICAL PHYSICS (3:2:2) Elementary treatment of topics in mechanics, heat, wave motion, and sound leading toward an understanding of technical applications. Prerequisite: 1-1/2 units of algebra. Prerequisite or concurrent: MATH 087 GQ.

151. TECHNICAL PHYSICS (3:2:2) Elementary treatment of topics in electricity, light, and modern physics leading toward an understanding of technical applications. Prerequisite: PHYS 150 DN.
201. (DN) GENERAL PHYSICS (4:4:0) Mechanics. Concurrent: MATH 140 GQ.
202. (DN) GENERAL PHYSICS (4:3:2) Electricity and magnetism. Prerequisite: PHYS 201 DN. Concurrent: MATH 141 GQ.
203. (DN) GENERAL PHYSICS (3:3:0) Wave motion, thermodynamics, and modern physics. Prerequisite: PHYS 202 DN.
204. (DN) GENERAL PHYSICS (4:3:2) Wave motion, thermodynamics, and modern physics, with laboratory. Prerequisite: PHYS 202 DN.
215. (DN) INTRODUCTORY PHYSICS (4:3:2) Selected topics in mechanics, heat, and sound. Prerequisite: algebra to quadratics.
237. INTRODUCTION TO QUANTUM PHYSICS (3:3:0) Relativity and quantum theory applied to selected topics in atomic, molecular, solid state, and nuclear physics. Concurrent: PHYS 203 DN, 204 DN, or 224 DN.
255. (DN) PHYSICS OF MUSIC AND SPEECH (3:3:0) Descriptive study of vibration and sound waves, hearing and speech, musical instruments, physical bases of harmony and scales.
265. (DN) INTRODUCTORY PHYSICS (4:3:2) Selected topics in light, electricity, and magnetism. Prerequisite or concurrent: PHYS 215 DN.
297. SPECIAL TOPICS (1-9)

PLANT SCIENCE (PLTSC)

200. ECOLOGY OF PLANT PRODUCTION (3:2:2) The influence of environment on the growth and development of plants as related to the technological aspects of crop production.

POLITICAL SCIENCE (PL SC)

001. (GS) INTRODUCTION TO AMERICAN NATIONAL GOVERNMENT (3:3:0) Introduction to development and nature of American political culture; constitutional/structural arrangements; electoral policy processes; sources of conflict and consensus.
002. AMERICAN PUBLIC POLICY (3:3:0) Examination of selected areas of public policy in America. Analysis of policy content, alternatives, and impact. Prerequisite: PL SC 001 GS.
003. (GS) INTRODUCTION TO COMPARATIVE POLITICS (3:3:0) Introduction to study of comparative government and politics: normative/empirical theories; government functions in modern societies; representative structures and processes.
014. (GS) INTERNATIONAL RELATIONS (3:3:0) Characteristics of modern nation-states and forces governing their international relations; nationalism; imperialism; diplomacy; current problems of war and peace. Credit will not be given for both this course and INT U 200 DS.
020. COMPARATIVE POLITICS—WESTERN EUROPE (3:3:0) Comparative analysis of political cultures, interest groups, parties, and decision-making processes in principal Western European political systems.
187. POLITICAL SCIENCE FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

PORTUGUESE (PORT)

001. ELEMENTARY PORTUGUESE I (4:3:2) For beginners. Grammar, with reading and writing of simple Portuguese; oral and aural work stressed.
002. ELEMENTARY PORTUGUESE II (4:3:2) Grammar, reading, and conversation continued; special emphasis on the language, literature, and life of Brazil. Prerequisite: PORT 001.
003. INTERMEDIATE PORTUGUESE (4:3:2) Grammar, reading, composition, and conversation. Prerequisite: PORT 002.
187. PORTUGUESE FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

POULTRY SCIENCE (PTYSC)

200. INTRODUCTION TO AVIAN BIOLOGY (3:2:2) Introduces the biology of birds; lectures, laboratories on anatomy and function, incubation, breeding, disease control, management techniques, and student projects. Prerequisite or concurrent: BIOL 101 DN.

PSYCHOLOGY

201. INTRODUCTION TO POULTRY MANAGEMENT (1:1:0) Business management in the production, processing, and marketing of broilers, eggs, and turkeys.
202. COMMERCIAL POULTRY PRACTICE (2:0:4) Commercial management procedures and techniques; feeding practices, selection and mating, disease control, housing, equipment, ventilation, and processing. Prerequisite or concurrent: PTYSC 201.

PSYCHOLOGY (PSY)

002. (GS) PSYCHOLOGY (3:3:0) Introduction to general psychology; principles of human behavior and their applications.
015. ELEMENTARY STATISTICS IN PSYCHOLOGY (4:3:2) Frequency distributions and graphs; measure of central tendency and variability; normal probability curve; elementary sampling and reliability; correlations; simple regression equations. Prerequisites: PSY 002 GS; MATH 021 GQ or 2 units of secondary school algebra.
021. CURRENT APPLICATIONS OF PSYCHOLOGY (3:3:0) Topics may be drawn from but not limited to opinion research, selection and placement, behavior modification, attitude measurement and change. Prerequisite: PSY 002 GS.
170. (DS;DF) PSYCHOLOGY OF WOMEN (3:3:0) Psychology of women in historical perspective and present evolvement. Stresses women's self-concepts with relation to individual and social psychological health. Prerequisite: PSY 002 GS.
187. PSYCHOLOGY FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
202. (DS) INTRODUCTION TO PERCEPTION (3:3:0) Survey of human perception and processing of perceptual information, with some reference to animal literature. Emphasizes vision and audition. Prerequisite: PSY 002 GS.
203. NEUROLOGICAL BASES OF HUMAN BEHAVIOR (3:3:0) An introduction to biopsychology, emphasizing the structure and function of the human brain.
204. (DS) INTRODUCTION TO LEARNING (3:3:0) A general survey of the learning area, including animal and human experiments, with the applicability of learning principles being discussed. Prerequisite: PSY 002 GS.
211. VOCATIONAL BEHAVIOR (3:3:0) Theories of vocational selection and career change; research and application.
213. (DS;DE) INTRODUCTION TO DEVELOPMENTAL PSYCHOLOGY (3:3:0) Developmental principles; physical growth; linguistic, intellectual, emotional, and social development from infancy to maturity. Prerequisite: PSY 002 GS.
220. (DS) (LING) INTRODUCTION TO PSYCHOLINGUISTICS (3:3:0) The learning of language; language development in the child; meaning as a problem for psychology. Prerequisite: PSY 002 GS.
221. (DS) INTRODUCTION TO COGNITIVE PSYCHOLOGY (3:3:0) Introduction to study of such higher mental processes as thinking and reasoning, imagery, concept formation, problem solving, and skilled performance. Prerequisite: PSY 002 GS.
231. (DS;DE) INDUSTRIAL PSYCHOLOGY (3:3:0) Personnel selection, training, accident prevention, morale, and organizational behavior. Prerequisites: PSY 002 GS.
236. (DS) (RL ST) INTRODUCTION TO PSYCHOLOGIES OF RELIGION (3:3:0) Introduction to major Western psychologies of religion (James, Freud, Jung) and to subsequent extensions of and departures from them.
237. (DS;DE) (RL ST) RELIGIONS, CULTURES, AND THERAPIES (3:3:0) Comparison of methods and goals of selected religious and secular therapies within their cultural contexts. Prerequisite: PSY 002 GS.
296. INDEPENDENT STUDIES (1-18)

RADIOLOGIC TECHNOLOGIST RADIOGRAPHER (R T R)

101. ORIENTATION AND MEDICAL TERMINOLOGY (3) Radiology history, radiation protection principles, medical ethics, with introduction to medical profession language.
102. RADIOGRAPHIC POSITIONING I: NURSING PROCEDURES/CONTRAST MEDIA (3) Basic positional terminology; emphasis on skeleton with introduction to skull; radiological applications of contrast media and nursing pertinent to radiology. Prerequisite: R T R 101.
103. RADIOGRAPHIC EXPOSURE I: FILM CRITIQUE I (3) Preliminary exposure factors concerning radiographic imaging; evaluation of radiographic films. Prerequisite: R T R 102.
104. RADIOGRAPHIC POSITIONING II: SPECIAL PROCEDURES (3) Cranium and body system positioning; invasive contrast procedures pertinent to radiology. Prerequisites R T R 103.
105. RADIOGRAPHIC EXPOSURE II: DARKROOM CHEMISTRY; FILM CRITIQUE II (3) Continuation of exposure factors concerning radiographic imaging, with emphasis on problem solving, evaluation of radiographs, and radiographic chemistry with processing techniques. Prerequisite: R T R 104.

106. RADIOGRAPHIC POSITIONING III: MEDICAL/SURGICAL DISEASES (3) Review of skeletal, cranium, and body systems, with emphasis on specialized positioning. Definition of various pathologies pertinent to bodily systems. Prerequisites: BIOL 014, R T R 105.

107. REGISTRY REVIEW I AND II (3:5:17) Registry Review I and II includes material in all required R T R courses, with emphasis upon national board examination. Prerequisite: R T R 106.

REAL ESTATE (R EST)

100. REAL ESTATE PRACTICE (3:3:0) Study of real estate to enable individuals to make successful transactions and decisions. Not available to baccalaureate business students or to those who have taken R EST 301.

301. REAL ESTATE FUNDAMENTALS (3:3:0) Introduction to urban real estate; economic forces affecting property rights; real estate markets and finance; land-use analysis; government policies.

RECREATION AND PARK MANAGEMENT (R P M)

120. LEISURE AND HUMAN BEHAVIOR (2:2:0) Introduces leisure from an integrated historical and contemporary perspective. Forces shaping leisure behavior and relationships between leisure and social institutions.

236. SUPERVISION AND GROUP DYNAMICS IN LEISURE SERVICES (3:2:2) Supervision as it relates to middle management in leisure service. Theories, strategies, group dynamics, and decision-making authority. Prerequisite: R P M 105.

277. LEISURE FOR PERSONS WITH DISABILITIES (3:3:0) Encouragement of appreciation of human diversity and impact of differences on leisure involvement.

356. PROGRAMMING IN LEISURE SERVICES (3:3:0) Translating agency philosophy and policy into understanding of organization, management, implementation, and evaluation of programming in leisure services. Prerequisite: R P M 236.

RELIGIOUS STUDIES (RL ST)

Note: For a complete list of Religious Studies courses that satisfy the General Education program requirements, see the Penn State *Baccalaureate Degree Programs Bulletin*.

001. (GH;DF) INTRODUCTION TO WORLD RELIGIONS (3:3:0) A historical and comparative survey of the principal beliefs and practices of the world's major religions.

003. (GH;DF) INTRODUCTION TO THE RELIGIONS OF THE EAST (3:3:0) Religious experience, thought, patterns of worship, morals, and institutions in relation to culture in Eastern religions.

004. (GH;DF) JEWISH AND CHRISTIAN FOUNDATIONS (3:3:0) Introduction to the perspectives, patterns of worship, morality, historical roots, and institutions of the Judaeo-Christian traditions; their relationships to culture.

140. (DH) RELIGION IN AMERICAN LIFE AND THOUGHT (3:3:0) The function, contributions, tensions, and perspectives of religion in American culture.

145. (DH;DF) (AAA S) AFRO-AMERICAN RELIGION (3:3:0) History and significance of the religious dimension from enslavement to the civil rights movement and contemporary churches and sects.

146. (DH;DF) (AAA S) THE LIFE AND THOUGHT OF MARTIN LUTHER KING, JR. (3:3:0) A survey of the civil rights leader including his religious beliefs, intellectual development, and philosophy for social change.

187. RELIGIOUS STUDIES FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

RURAL SOCIOLOGY (R SOC)

* 011. (GS) INTRODUCTORY RURAL SOCIOLOGY (3:3:0) Basic sociological concepts applied to, rural societal institutions and change in rural communities, some historical causes and current consequences.

RUSSIAN (RUS)

001. ELEMENTARY RUSSIAN I (4:3:2) Audio-lingual approach to basic Russian; writing. Students who have received high school credit for two or more years of Russian may not schedule this course for credit without permission of the department.

*Students may take only one course for General Education credit from R SOC 011 GS or SOC 001 GS.

SCIENCE, TECHNOLOGY, AND SOCIETY

002. ELEMENTARY RUSSIAN II (4:3:2) Audio-lingual approach to basic Russian continued; writing. Students who have received high school credit for four years of Russian may not schedule this course for credit without permission of the department. Prerequisite: RUS 001.
003. INTERMEDIATE RUSSIAN (4:3:2) Emphasis on reading unsimplified texts; composition; grammatical analysis. Prerequisite: RUS 002.
005. ELEMENTARY TECHNICAL RUSSIAN: ACQUISITION OF SKILLS IN READING (4:3:2) An introduction to the study of Russian grammar and the theory and practice of translation.
006. RUSSIAN TEXTS AND ELEMENTARY TECHNICAL WRITING (4:3:2) Instruction in the theory and techniques of translation and elementary technical writing. Prerequisite: RUS 005 or 001G.
100. (GH:DF) RUSSIAN CULTURE AND CIVILIZATION (3:3:0) The Russian people from the tenth century to present times; their literature, arts, music, science, and philosophy. In English.
110. (DH) RUSSIAN FOLKLORE (3:3:0) Study of *byliny*, lyrical and historical songs, folktales, drama, ceremonial poetry, chants, charms, proverbs, and mythology of Russia. In English.
120. (DH) THEATRICAL ARTS OF RUSSIA (3:3:0) Survey of Russian dramatic literature, including plays, operas, ballets, and cinema. In English.
- 141W. RUSSIAN LITERATURE IN ENGLISH TRANSLATION: 1800–1870 (3:3:0) Pushkin, Lermontov, Gogol, the critics, Turgenev, Dostoevsky, Tolstoy. Writing assignments will serve as a major way of exploring subject matter.
- 142W. RUSSIAN LITERATURE IN ENGLISH TRANSLATION: 1870–PRESENT (3:3:0) Dostoevsky, Tolstoy, Chekhov, Gorky, symbolists, selected Soviet authors. Writing assignments will serve as a major way of exploring subject matter.
187. RUSSIAN FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
204. READINGS IN RUSSIAN I (3:3:0) Intensive reading of Russian texts, mainly short fiction of classic Russian authors; conversation; composition. Prerequisite: RUS 003 or 006.
214. READINGS IN RUSSIAN II (3:3:0) Intensive readings of Russian texts, mainly nineteenth-century memoirs and intellectual history; conversation; composition. Prerequisite: RUS 003 or 006.
221. RUSSIAN CONVERSATION (3:3:0) Practice aimed at developing fluency in the use of the grammatical constructions and vocabulary essential for everyday conversation. Prerequisite: RUS 003 or 006.
296. INDEPENDENT STUDIES (1–18)
297. SPECIAL TOPICS (1–9)

SCIENCE, TECHNOLOGY, AND SOCIETY (S T S)

047. (SOC) WILDERNESS, TECHNOLOGY, AND SOCIETY (3:3:0) Impact of developments in science, literature, and art on changing attitudes toward nature; consequences for conservation, preservation, environmental ethics.
100. (GH) THE ASCENT OF HUMANITY (3:3:0) A survey of some of the intellectual achievements that highlight humanity's attempts to understand nature and shape the environment.
105. (GHS) (FD SC) FOOD FACTS AND FADS (3:3:0) Impact on society and the individual of modern food technology, food laws, additives, etc.; historical, current, and futuristic aspects.

SERBO-CROATIAN (S CR)

- 001-002-003. BEGINNING SERBO-CROATIAN (4:3:2 each) An elementary course to enable the student to achieve a measure of proficiency in reading and speaking Serbo-Croatian.
187. SERBO-CROATIAN FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

SLAVIC (SLAV)

187. SLAVIC FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
296. INDEPENDENT STUDIES (1–19)

SOCIAL SCIENCE (SO SC)

001. (DS) URBANIZATION (3:3:0) An overview of the social sciences, including an interdisciplinary analysis of the urban process.

002. CONTEMPORARY SOCIETY (3:3:0) Selected contemporary issues in the perspective of history, sociology, psychology, economics, and political science.

110. (DS) INTRODUCTION TO CONTEMPORARY AFRICA (3:3:0) Consideration of influences and forces at work; leaders, elites, and groups. Analysis of problems and issues in Africa.

187. SOCIAL SCIENCE FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

297. SPECIAL TOPICS (1-9)

SOCIOLOGY (SOC)

* 001. (GS) INTRODUCTORY SOCIOLOGY (3:3:0) The nature and characteristics of human societies and social life.

003. (GS) INTRODUCTORY SOCIAL PSYCHOLOGY (3:3:0) The impact of the social environment on perception, attitudes, and behavior.

005. (GS) SOCIAL PROBLEMS (3:3:0) Current social problems such as economic, racial, and gender inequalities; social deviance and crime; population, environmental, energy, and health problems.

007. INTRODUCTION TO SOCIAL RESEARCH (3:3:0) Fundamental concepts and problems in social science research; design, measurement, sampling, causation, validity, interpretation. Prerequisite: 3 credits in sociology.

012. (DS) CRIMINOLOGY (3:3:0) Explanations and measurement of crime; criminal law; characteristics of criminals and victims; violent, property, white-collar, organized, and sexual crimes.

013. (DS) JUVENILE DELINQUENCY (3:3:0) Juvenile conduct, causes of delinquency, current methods of treatment; organization and function of agencies concerned with delinquency.

015. (DS) URBAN SOCIOLOGY (3:3:0) City growth and decline; impact of city life on individuals, families, neighborhoods, and government; urban life-styles.

023. (DS) POPULATION AND POLICY ISSUES (3:3:0) Local, national, and international population trends; basic techniques of demographic analysis; population problems; implications for public planning and policy.

† 030. (GS) SOCIOLOGY OF THE FAMILY (3:3:0) Family structure and interaction; functions of the family as an institution: cross-cultural comparisons.

047. (S T S) WILDERNESS, TECHNOLOGY, AND SOCIETY (3:3:0) Impact of developments in science, literature, and art on changing attitudes toward nature; consequences for conservation, preservation, environmental ethics.

055. (DS) WORK IN MODERN SOCIETY (3:3:0) The nature of work in varied occupational and organizational settings; current trends and work life in the future.

110. (DS;DF) (WMNST) THE SOCIOLOGY OF SEX ROLES (3:3:0) Changing sex role expectations and behavior for men and women in contemporary society.

119. (DS;DF) RACE AND ETHNIC RELATIONS (3:3:0) Historical patterns and current status of racial and ethnic groups; inequality, competition, and conflict; social movements; government policy.

187. SOCIOLOGY FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

SOIL SCIENCE (SOILS)

101. INTRODUCTION TO SOILS (3:2:2) A study of the characteristics of soils and their influence on land use, environmental quality, and plant growth.

SPANISH (SPAN)

001. ELEMENTARY SPANISH I (4:3:2) Audio-lingual approach to basic Spanish; writing. Students who have received high school credit for two or more years of Spanish may not schedule this course for credit without permission of the department.

*Students may take only one course for General Education credit from R SOC 011 GS or SOC 001 GS

†Students may take only one course for General Education credit from HD FS 129 GS;DE or SOC 030 GS.

SPEECH COMMUNICATION

002. **ELEMENTARY SPANISH II (4:3:2)** Audio-lingual approach to basic Spanish continued; writing. Students who have received high school credit for four years of Spanish may not schedule this course for credit without permission of the department. Prerequisite: SPAN 001.
003. **INTERMEDIATE SPANISH (4:3:2)** Audio-lingual review of structure; writing; reading. Prerequisite: SPAN 002.
010. **INTENSIVE SPANISH (6:5:2)** Basic Spanish grammar; oral, aural, and writing skills. (This course is essentially equivalent to SPAN 001, and first half of SPAN 002.)
020. **INTENSIVE SPANISH (6:5:2)** Basic and intermediate Spanish grammar, oral, aural, and writing skills. (This course is essentially equivalent to the second half of SPAN 002 and all of SPAN 003.)
130. (GH;DF) **IBERIAN CIVILIZATION (3:3:0)** Spanish and Portuguese life from the medieval period to the present; literature, the arts, and contemporary problems in historical perspective.
131. (GH;DF) **IBERO-AMERICAN CIVILIZATION (3:3:0)** Spanish American and Brazilian life from the Conquest to the present: literature, art, the indigenous heritage, and contemporary problems.
187. **SPANISH FRESHMAN SEMINAR (3:3:0)** The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
230. (DH) **MASTERPIECES OF SPANISH LITERATURE IN ENGLISH TRANSLATION (3:3:0)** Emphasis on works and authors of international importance. Lectures, readings, and written work in English.
231. (DH) **MASTERPIECES OF SPANISH AMERICAN LITERATURE IN ENGLISH TRANSLATION (3:3:0)** Emphasis on works and authors of international importance. Lectures, readings, and written work in English.

SPEECH COMMUNICATION (SPCOM)

100. (GWS) **EFFECTIVE SPEECH (3:3:0)** Introduction to speech communication: formal speaking, group discussion, analysis and evaluation of messages.

Unit A. Principles of communication, implemented through presentation of speeches, with some attention to group discussion and message evaluation.

Unit B. Principles of communication, implemented through group problem solving, with some attention to formal speaking and message evaluation.

Unit C. Principles of communication, implemented through analysis and evaluation of messages, with some attention to formal speaking and group discussion.

187. **SPEECH COMMUNICATION FRESHMAN SEMINAR (3:3:0)** The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.

STATISTICS (STAT)

100. (GQ) **STATISTICAL CONCEPTS AND REASONING (3:3:0)** Introduction to the art and science of decision making in the presence of uncertainty.
200. (GQ) **ELEMENTARY STATISTICS (4:3:2)** Descriptive statistics, frequency distributions, probability, binomial and normal distributions, statistical inference, linear regression, and correlation. Prerequisite: 2 units in algebra.
250. (GQ) **INTRODUCTION TO BIOSTATISTICS (3:3:0)** Statistical analysis and interpretation of data in the biological sciences; probability; distributions; statistical inference for one- and two-sample problems. Prerequisite: MATH 017 or 3 credits of calculus.
301. (GQ) **STATISTICAL ANALYSIS I (3:3:0)** Probability concepts; nature of statistical methods; elementary distribution and sampling theory; fundamental ideas relative to estimation and testing hypotheses. Prerequisite: 3 credits of calculus.
318. (MATH) **ELEMENTARY PROBABILITY (3:3:0)** Combinatorial analysis, axioms of probability, conditional probability and independence, discrete and continuous random variables, expectation, limit theorems, additional topics. Students who have passed either STAT (MATH) 414 or 418 may not schedule this course for credit. Prerequisite: MATH 141 GQ.

SURVEYING (SUR)

111. **PLANE SURVEYING (3:2:3)** Theory of plane surveying; use, care, and adjustments of surveying equipment; traversing, areas, leveling, stadia, and plane table mapping. Prerequisite: MATH 087 GQ.
112. **CURVES AND EARTHWORK (3:2:3)** Computation and laying out of horizontal and vertical curves; calculation of cut and fill; setting slope stakes for construction. Prerequisite or concurrent: SUR 111, MATH 087 GQ.

162. **COMPUTER ASSISTED MAPPING (3:3:2)** Advanced CAD application related to the mapping sciences; map projection systems; topographic map production including data collection, contouring, and map compilation. Prerequisites: EG T 182, SUR 111.
211. **CONSTRUCTION SURVEYING APPLICATIONS (2:1:3)** Application of surveying principles in the field of construction: building layout, pipe/culvert, street, quantity, and as-built surveys. Prerequisites: SUR 112, 162.
251. **GEODETIC SURVEYING (3:2:3)** Basic geodetic models; observation reduction to ellipsoid; astronomic observations; statistical error analysis of measurements; measurement error propagation. Prerequisites: MATH 088 or 140, SUR 111.
272. **CADASTRAL SURVEYING (3:3:0)** Evolution of land records systems; PLS: property ownership and conveyancing; common and statute law; rules of construction; boundary location procedures. Prerequisite: SUR 111.
313. **PRACTICAL FIELD PROBLEMS (4:1:9)** Geodetic, topographic, astronomic, construction surveying; equipment adjustment; precise leveling; land subdivision; map construction; uses of GIS. Prerequisites: SUR 162, 251.
321. **PHOTOGRAMMETRY (3:2:2)** Basic principles in metric photogrammetry with single and stereopair photos, coordinate transformations; map production using stereo imagery; flight planning. Prerequisite: SUR 162.
325. **ADVANCED PHOTOGRAMMETRY (3:2:2)** Advanced topics in metric photogrammetry; analytical techniques in photogrammetry; applications in close-range photogrammetry; introduction to digital photogrammetry. Prerequisites: MATH 220 or 230; SUR 242, 321.
331. **REMOTE SENSING (3:2:2)** Electromagnetic radiation; electro-optical sensors, radar systems; space platforms; processing, classification, interpretation of imagery; overview of uses. Prerequisite or concurrent: SUR 321.
345. **NUMERICAL METHODS IN ADJUSTMENT COMPUTATIONS (3:2:2)** Computer optimization techniques used in adjustment of large, sparse, positive-definite matrices, efficient storage schemes. Prerequisite: SUR 242. Prerequisite or concurrent: MATH 220, 231; or MATH 230.
351. **GEODETIC MODELS (3:3:0)** Three-dimensional geodesy; computations on the ellipsoid; map projections; reduction of observations and elements of physical geodesy. Prerequisite: SUR 251.
362. **MULTIPURPOSE LAND INFORMATION SYSTEMS (3:2:2)** Basic concepts in geographic information systems; spatial reference frameworks; map and text data; digital environments; software and hardware platforms. Prerequisites: SUR 251, 272, 321.
365. **GEOGRAPHIC INFORMATION SYSTEMS APPLICATIONS (3:2:2)** Using a GIS as a decision tool; spatial modeling; data structure and management issues; legal issues; case studies; application projects. Prerequisite: SUR 362.
- 372W. **LEGAL ASPECTS OF LAND SURVEYING (3:3:0)** Legal research; rules of evidence including classification and evaluation; unwritten rights; land description composition; easements. Prerequisite: SUR 272. Concurrent: ENGL 202C GWS.
375. **LAND USE CONTROLS (2:2:0)** Historical overview of private restrictions and public regulation of land use; the planning process; local zoning ordinances and subdivision regulations. Prerequisite: SUR 272.
385. **ENGINEERING LAND SURVEYS (3:2:2)** Storm water management, methodologies, design, and regulatory requirements, soil erosion and sedimentation control, technical requirements, control plan, permits, and compliance. Prerequisites: C E 261 or CE T 261; SUR 112, 162.
497. **SPECIAL TOPICS (1-9)**

TELECOMMUNICATIONS (TELCM)

140. **INTRODUCTION TO TELECOMMUNICATIONS SYSTEMS (2:2:0)** Elements of telecommunications systems, including telephones, transmission lines, switching, digital data, and transmission by microwave, satellite, and fiber optics.
241. **SWITCHING AND TRAFFIC (3:3:0)** Routing of telecommunications messages: characteristics, methods, and control. Prerequisite: TELCM 140.
242. **INTRODUCTION TO TELECOMMUNICATIONS LABORATORY (1:0:2)** Techniques used for measurements of basic telecommunications circuits and equipment. Prerequisite or concurrent: TELCM 241.
243. **TRANSMISSION (3:3:0)** Transmission of telecommunications information, including design problems. Prerequisite: TELCM 140.
244. **ADVANCED TELECOMMUNICATIONS LABORATORY (1:0:2)** Testing and measurement of advanced telecommunication transmission and switching equipment, including practical alignment and testing of operational systems. Prerequisite or concurrent: TELCM 243.

THEATRE ARTS (THEA)

100. (GA;DEX) THE ART OF THE THEATRE (3:3:0) Survey of the history, craft, and art of the theatre to support an informed appreciation of theatrical events.
102. (DA) FUNDAMENTALS OF ACTING (3:3:0) Introduction to performance skills for nontheatre majors.
103. FUNDAMENTALS OF DIRECTING (3:3:0) Training and experience in basic skills of directing. Designed for non-theatre majors.
104. FUNDAMENTALS OF THEATRE PRODUCTION (3:3:0) Training and experience in basic skills of technical theatre. Designed for nontheatre majors.
109. (DA) THE DRAMATIC ARTS IN THE MASS MEDIA (3:3:0) The place of television-radio-film drama in our culture; relationship with other art forms; standards of evaluation.
160. INTRODUCTION TO COSTUME CRAFTS (3:2:4) Process of costuming combined with laboratory projects. Crew experience on major productions.
170. INTRODUCTION TO STAGE LIGHTING PRODUCTION TECHNIQUES (3:2:4) Introduction to theatre lighting facilities, equipment, and practice. Practical experience with major productions.
180. INTRODUCTION TO STAGECRAFT (3:2:4) Introduction to methods, materials, and equipment used in scenic construction for the theatre. Practical experience with departmental productions.
210. INTRODUCTION TO CREATIVE DRAMATICS (3:1:4) Introduction and direct experience in creative dramatics and survey of children's theatre.
296. INDEPENDENT STUDIES (1-18)

WILDLIFE (WILDL)

101. INTRODUCTION TO WILDLIFE MANAGEMENT (3:3:0) Basic principles of wildlife management. Introduction to general ecology and wildlife population dynamics.
103. ANIMAL IDENTIFICATION (3:2:3) Identification of mammals, birds, reptiles, and amphibians; introduction to their life histories.
106. WILDLIFE MANAGEMENT TECHNIQUES (4:3:3) Overview of laboratory and field techniques for natural resource research and management; scientific writing and computer applications emphasized. Prerequisite: WILDL 101.
204. WILDLIFE MENSURATION (4:4:0) Estimation and analysis of animal populations and their habitats, including sampling considerations and basic biometry. Prerequisite: 3 credits in mathematics.
207. OUTDOOR RECREATION (3:2:3) Sociology, history, and economics of recreational demand; recreational areas and management procedures.
208. TERRESTRIAL WILDLIFE MANAGEMENT (3:2:4) Ecological characteristics and manipulation of terrestrial habitats; control of wildlife populations. Prerequisites: FOR 240, 250, WILDL 101, 103, 106.
209. ANIMAL HANDLING AND CARE (4:3:3) Techniques in capturing, marking, and maintaining wild animals in captivity. Wildlife physiology, parasitology, and necropsy procedures are covered. Prerequisite: WILDL 101.
211. AERIAL PHOTO INTERPRETATION (4:2:6) Techniques of photo interpretation; type mapping of wildlife environments; photo censusing of wild animals.
213. WETLANDS AND FISHERIES MANAGEMENT (3:3:3) Introduction to basic limnology. Ecology and management of swamp, marsh, pond, and stream habitats and their animal populations. Prerequisites: WILDL 101, 103, 106, 204.

WOMEN'S STUDIES (WMNST)

001. (GS;DF) WOMEN'S STUDIES (3:3:0) Interdisciplinary consideration of the scholarly theories and research pertaining to women's experiences and women's status in contemporary American society.
110. (DS;DF) (SOC) THE SOCIOLOGY OF SEX ROLES (3:3:0) Changing sex role expectations and behavior for men and women in contemporary society.
187. WOMEN'S STUDIES FRESHMAN SEMINAR (3:3:0) The meaning and advantages of a liberal arts education in the context of a specific discipline. Prerequisites: first-semester standing and enrollment in the College of the Liberal Arts.
194. (DH;DF) (ENGL) WOMEN WRITERS (3:3:0) Short stories, novels, poetry, drama, and essays by British, American, and other English-speaking women writers.
205. (DF) (COMM) WOMEN, MINORITIES, AND THE MEDIA (3:3:0) Analysis of historical, economic, legal, political, and social implications of the relationship among women, minorities, and the mass media.

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- U.Ed. DUR 94-22

Notes



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